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Fri, 22 Oct 2021 05:33PM

High-Speed Expendable Aerial Target ABHYAS successfully flight-tested by DRDO

Key highlights:

- ***Abhyas is designed & developed by DRDO's Aeronautical Development Establishment (ADE), Bengaluru.***
- ***The current flight test is carried out as a part of developmental flight trials.***

ABHYAS - the High-speed Expendable Aerial Target (HEAT) was successfully flight-tested today by Defence Research and Development Organisation (DRDO) from the Integrated Test Range (ITR), Chandipur off the coast of Bay of Bengal in Odisha. The vehicle can be used as an aerial target for evaluation of various missile systems. The performance of the target aircraft was monitored through telemetry and various tracking sensors including Radars and Electro Optical Tracking System (EOTS).

Raksha Mantri, Shri Rajnath Singh congratulated DRDO for the successful flight trial of Abhyas. The current flight test is carried out as a part of developmental flight trials. Expression of interest for production of the vehicle has already been floated to Indian industries. This indigenous target aircraft, once developed, will meet the requirements of High-speed Expendable Aerial Targets (HEAT) for Indian Armed Forces.

ABHYAS is designed & developed by DRDO's Aeronautical Development Establishment (ADE), Bengaluru. The air vehicle is launched using twin under-slung boosters which provide the initial acceleration to the vehicle. It is powered by a gas turbine engine to sustain a long endurance flight at subsonic speed. The target aircraft is equipped with MEMS based Inertial Navigation System (INS) for navigation along with the Flight Control Computer (FCC) for guidance and control. The vehicle is programmed for fully autonomous flight. The check-out of air vehicle is done using laptop-based Ground Control Station (GCS).

Dr G Satheesh Reddy, Secretary, Department of Defence R&D and Chairman, DRDO also congratulated the teams associated with successful flight test of 'ABHYAS' and termed it as a force-multiplier considering its accuracy and effectiveness.

https://pib.gov.in/PressReleasePage.aspx?PRID=1765772

पत्र सूचना कार्यालय
भारत सरकार
रक्षा मंत्रालय

Fri, 22 Oct 2021 05:33PM

डीआरडीओ द्वारा हाई-स्पीड एक्सपेंडेबल एरियल टारगेट अभ्यास का सफलतापूर्वक उड़ान-परीक्षण

प्रमुख बातें:

- ***अभ्यास को डीआरडीओ के एयरोनॉटिकल डेवलपमेंट एस्टेब्लिशमेंट (एडीई), बेंगलुरु द्वारा डिजाइन और विकसित किया गया है।***
- ***वर्तमान उड़ान परीक्षण विकासात्मक उड़ान परीक्षणों के अंतर्गत किया गया है।***

अभ्यास - हाई-स्पीड एक्सपेंडेबल एरियल टारगेट (एचइएटी) का आज ओडिशा में बंगाल की खाड़ी के तट पर एकीकृत परीक्षण रेंज (आईटीआर), चांदीपुर से रक्षा अनुसंधान और विकास संगठन (डीआरडीओ) द्वारा सफलतापूर्वक उड़ान परीक्षण किया गया। इस वाहन का उपयोग विभिन्न मिसाइल प्रणालियों के मूल्यांकन हेतु हवाई लक्ष्य के रूप में किया जा सकता है। लक्षित विमान के प्रदर्शन की निगरानी टेलीमेट्री और रडार एवं इलेक्ट्रो ऑप्टिकल ट्रैकिंग सिस्टम (ईओटीएस) सहित विभिन्न ट्रैकिंग सेंसर के माध्यम से की गई।

रक्षा मंत्री श्री राजनाथ सिंह ने अभ्यास के सफल उड़ान परीक्षण के लिए डीआरडीओ को बधाई दी। वर्तमान उड़ान परीक्षण विकासात्मक उड़ान परीक्षणों के अंतर्गत किया गया है। भारतीय उद्योगों के लिए वाहन के उत्पादन के लिए रुचि की अभिव्यक्ति पहले ही जारी की जा चुकी है। यह स्वदेशी लक्ष्य विमान एक बार विकसित होने के बाद भारतीय सशस्त्र बलों के लिए हाई-स्पीड एक्सपेंडेबल एरियल टारगेट (एचइएटी) की आवश्यकताओं को पूरा करेगा ।

अभ्यास को डीआरडीओ के वैमानिकी विकास प्रतिष्ठान (एडीई) बेंगलुरु द्वारा डिजाइन तथा विकसित किया गया है। एयर व्हीकल को ट्विन अंडर-स्लंग बूस्टर का उपयोग करके लॉन्च किया जाता है जो वाहन को प्रारंभिक त्वरण प्रदान करते हैं। यह गैस टर्बाइन इंजन द्वारा संचालित है जो सबसोनिक गति से लंबी एन्ड्योरेंस उड़ान को बनाए रखता है। टारगेट एयरक्राफ्ट मार्गदर्शन और नियंत्रण के लिए उड़ान नियंत्रण कंप्यूटर (एफसीसी) के साथ नेविगेशन के लिए एमईएमएस आधारित जड़त्वीय नेविगेशन प्रणाली (आईएनएस) से लैस है। वाहन को पूरी तरह से स्वायत्त उड़ान के लिए प्रोग्राम किया गया है। लैपटॉप आधारित ग्राउंड कंट्रोल स्टेशन (जीसीएस) का उपयोग करके हवाई वाहन का चेक-आउट किया जाता है।

रक्षा अनुसंधान एवं विकास विभाग के सचिव और डीआरडीओ के अध्यक्ष डॉ. जी सतीश रेड्डी ने भी 'अभ्यास' के सफल उड़ान परीक्षण से जुड़ी टीमों को बधाई दी और इसकी सटीकता और प्रभावशीलता को देखते हुए इसे फ़ोर्स मल्टीप्लायर करार दिया ।

https://pib.gov.in/PressReleasePage.aspx?PRID=1765829

Hindustan Times

Sat, 23 Oct 2021

DRDO successfully flight-tests Abhyas aerial target vehicle from Chandipur ITR

Defence minister Rajnath Singh congratulated DRDO for the successful flight trial of Abhyas, which was carried out as a part of developmental flight trials

Edited by Kunal Gaurav

New Delhi: The Defence Research and Development Organisation (DRDO) on Friday successfully flight-tested Abhyas High-speed Expendable Aerial Target (HEAT) from the Integrated Test Range in Chandipur, off the Bay of Bengal coast in Odisha. After the flight test, the ministry of defence said in a statement that the target aircraft will meet the requirements of HEAT for the armed forces.

The indigenous unmanned aerial vehicle will be used as a target for the evaluation of various missile systems.

Defence minister Rajnath Singh congratulated DRDO for the successful flight trial of Abhyas, which was carried out as a part of developmental flight trials.

Designed and developed by DRDO's Aeronautical Development Establishment (ADE), the indigenous unmanned aerial vehicle will be used as a target for the evaluation of various missile systems. Abhyas HEAT is launched using twin under-slung boosters which provide the initial acceleration to the vehicle.

The state-of-the-art UAV is powered by a small gas turbine engine to sustain a long endurance flight at subsonic speed.

The ministry of defence said that the performance of the target aircraft was monitored through telemetry and various tracking sensors. The expression of interest for the production of the vehicle has already been floated to Indian industries, it added.

Terming Abhyas as a force multiplier, DRDO Chairman Dr G Satheesh Reddy congratulated the teams associated with the successful flight test of the aerial target which demonstrated the accuracy and effectiveness of the UAV.

Abhyas HEAT is equipped with a MEMS-based Inertial Navigation System (INS) for navigation along with the Flight Control Computer (FCC) for guidance and control. According to the ministry, the vehicle is programmed for fully autonomous flight and their check-out is done using a laptop-based Ground Control Station (GCS).

https://www.hindustantimes.com/india-news/drdo-successfully-flight-tests-abhyas-aerial-target-vehicle-from-chandipur-itr-101634912129774.html

THE NEW INDIAN EXPRESS

Sat, 23 Oct 2021

Home grown Abhyas drone a force multiplier, claims DRDO

The air vehicle is launched using twin under-slung boosters which provide the initial acceleration to the vehicle

By Hemant Kumar Rout

Bhubaneswar: The DRDO successfully flight tested an indigenously developed high-speed expendable aerial target (HEAT) Abhyas from a defence facility off Odisha coast on Friday. The unmanned aerial vehicle was flown from the launching complex III of the Integrated Test Range (ITR) and met the mission parameters. Once fully developed, the pilotless aircraft will replace target aircraft Lakshya and British drone Banshee.

Abhyas aerial vehicle being test flown from ITR

The trial was conducted by the officials of Bengaluru-based Aeronautical Development Establishment (ADE). The aerial vehicle achieved the user requirement of 5 km flying altitude, 0.5 Mach speed, 30 minute endurance and turn capability. Designed and developed by ADE, a DRDO lab, it can be used as an aerial target for evaluation of various missile systems. The performance of the target aircraft was monitored through telemetry and various tracking sensors including radars and electro-optical tracking systems.

A defence official said the flight test was carried out as a part of developmental trials. Expression of interest for production of the drone has already been floated. It will meet the requirements of high speed expendable target for Indian Armed Forces, he said.

Abhyas was designed for autonomous flight with the help of an autopilot. The air vehicle is launched using twin under-slung boosters which provide the initial acceleration to the vehicle. "The target aircraft is equipped with micro-electromechanical-based inertial navigation system (INS) for navigation along with the flight control computer (FCC) for guidance and control. The vehicle is programmed for fully autonomous flight. The check-out of air vehicle is done using laptop-based ground control station," the official informed.

What differentiates Abhyas from Lakshya is its wing position. The wings of the Abhyas are positioned on the upper-side of the aircraft whereas the Lakshya has under-body wings. However the wings and tail plane of the Abhyas have been derived from the Lakshya by downsizing them.

Secretary of Department of Defence R&D and DRDO Chairman G Satheesh Reddy termed the target aircraft Abhyas as a force-multiplier considering its accuracy and effectiveness. Defence Minister Rajnath Singh congratulated DRDO for the successful flight trial of Abhyas.

https://www.newindianexpress.com/states/odisha/2021/oct/23/home-grown-abhyas-drone-a-force-multiplier-claims-drdo-2374775.html

INDIA TODAY

Sat, 23 Oct 2021

DRDO successfully tests high-speed expendable aerial target Abhyas in Odisha

The Defence Research and Development Organisation (DRDO) conducted the successful flight test of the indigenously-designed Abhyas - High-speed Expendable Aerial Target (HEAT) in Odisha

By Manjeet Negi

New Delhi: India on Friday successfully conducted the flight test of the indigenously-designed Abhyas - High-speed Expendable Aerial Target (HEAT) in Odisha.

The trial was carried out by the Defence Research and Development Organisation (DRDO) from the Integrated Test Range (ITR) in Chandipur off the coast of Bay of Bengal in Odisha.

During the trial, the target was flown from a ground-based controller in a pre-designated flight path at subsonic speed, the DRDO said in a statement. The vehicle can be used as an aerial target for evaluation of various missile systems.

Abhyas is designed and developed by DRDO's Aeronautical Development Establishment (ADE), Bengaluru.

During the test flight, low altitude flight capability with radio altimeter in loop were demonstrated. The IR flares were ignited from the ground station during the test flight. The performance of the target aircraft was monitored through telemetry and various tracking sensors including Radars and Electro Optical Tracking System (EOTS), the DRDO said

Abhyas is designed and developed by DRDO's Aeronautical Development Establishment (ADE), Bengaluru. The air vehicle is launched using twin under-slung boosters which provide the initial acceleration to the vehicle. It is powered by a gas turbine engine to sustain a long endurance flight at subsonic speed. The target aircraft is equipped with MEMS based Inertial Navigation System (INS) for navigation along with the Flight Control Computer (FCC) for guidance and control.

The vehicle is programmed for fully autonomous flight. The check-out of air vehicle is done using laptop-based Ground Control Station (GCS).

The current flight test is carried out as a part of developmental flight trials. Expression of interest for production of the vehicle has already been floated to Indian industries. This indigenous target aircraft, once developed, will meet the requirements of High-speed Expandable Aerial Targets (HEAT) for Indian Armed Forces.

https://www.indiatoday.in/india/story/drdo-successful-flight-test-abhyas-odisha-1868083-2021-10-22

जागरण

Sat, 23 Oct 2021

एरियल टार्गेट यान 'ABHYAS' का सफल परीक्षण, रक्षा मंत्री ने DRDO को दी बधाई

रक्षा मंत्रालय (Ministry of Defence) की ओर से दी गई जानकारी के अनुसार ABHYAS की डिजायनिंग से लेकर विकसित करने तक का काम DRDO के बेंगलुरु स्थित एयरोनाटिकल डेवलपमेंट एस्टैबलिशमेंट (ADE) ने किया है। विगत कई वर्षो से इस पर काम हो रहा था।

By Monika Minal

नई दिल्ली: रक्षा अनुसंधान व विकास संगठन (Defence Research and Development Organisation, DRDO) ने शुक्रवार को ओडिशा के चांदीपुर एकीकृत परीक्षण रेंज (ITR) के एलसी-3 से हाई स्पीड एक्सपेंडेबल एरियल टारगेट (HEAT), ABHYAS, का सफलतापूर्वक परीक्षण किया। स्वदेशी तकनीक से बना यह ड्रोन जमीन व हवा दोनों ही मोर्चो से लक्ष्य भेदने में सक्षम है। परीक्षण के दौरान अपने लक्ष्य पर यह सफलतापूर्वक पहुंचा। इस ड्रोन से भारतीय रक्षा प्रणाली को और मजबूती मिलेगी।

रक्षा मंत्री राजनाथ सिंह ने दी बधाई

रक्षा मंत्री राजनाथ सिंह (Rajnath Singh) ने DRDO को ABHYAS के सफल परीक्षण के लिए बधाई दी। रक्षा मंत्रालय (Ministry of Defence) की ओर से दी गई जानकारी के अनुसार, ABHYAS की डिजायनिंग से लेकर विकसित करने तक का काम DRDO के बेंगलुरु स्थित एयरोनाटिकल डेवलपमेंट एस्टैबलिशमेंट (ADE) ने किया है। विगत कई वर्षो से इस पर काम हो रहा था।

अत्याधुनिक उपकरणों से लैस है यान

इस यान की लांचिंग में ट्विन बूस्टर्स का इस्तेमाल किया गया है जो व्हिकल को शुरुआती गति देती है। इसमें गैस टर्बाइन इंजन लगाया गया है साथ ही यह MEMS (Micro-Electro-Mechanical Systems) से लैस है जो नैविगेशन के लिए INS (Inertial Navigation System) पर आधारित है। साथ ही यान के गाइडेंस और नियंत्रण के लिए इसमें फ्लाइट कंट्रोल कंप्यूटर (FCC) लगाया गया है। DRDO के सेक्रेटरी और चेयरमैन डा जी सतीश रेड्डी ने भी इस सफल परीक्षण को अंजाम दिलाने वाली टीम को बधाई दी।

इस एयर व्हीकल को ट्वीन अंडर स्लैंग बूस्टर का इस्तेमाल करते हुए लांच किया गया। इस दौरान इसके मार्ग, गति आदि पर निगरानी रखी गई। यह एक छोटे से गैस टरबाइन इंजन से संचालित होता है। आज इसके परीक्षण के दौरान आइटीआर और डीआरडीओ से जुड़े कई वरिष्ठ अधिकारियों और विज्ञानियों का दल मौके पर मौजूद रहे।

https://www.jagran.com/news/national-drdo-successfully-tests-high-speed-expendable-aerial-target-abhyas-22140993.html

NDTV

Sat, 23 Oct 2021

"Amazing": Rajnath Singh after experiencing Tejas LCA flight simulator

Last week Mr Singh underlined the government's goal of making India a leader in the defence sector, "from design to production and export"

Bengaluru: Defence Minister Rajnath Singh tweeted Friday morning to say he had an "amazing experience 'flying'" the Tejas LCA (Light Combat Aircraft) on a simulator at the Aeronautical Development Establishment in Bengaluru.

He posted a photo of himself sitting in the simulator's cockpit - which was lit up with the Tejas' HUD, or heads-up display, showing flight altitude and other data.

A trained pilot was sitting next to him and holding the controls.

"Had an amazing experience of flying in (the) LCA Tejas Simulator at the Aeronautical Development Establishment (ADE) facility in Bengaluru," the Defence Minister wrote.

In February the government confirmed a ₹ 45,696 crore deal to buy 83 Tejas LCA

The Aeronautical Development Establishment, or ADE, conceptualises and develops of state-of-the-art UAVs, or Unmanned Aerial Vehicles, and flight systems for the country's armed forces. Its primary R&D is in the fields of UAVs, pilotless target aircraft, aerial weapons, and flight sims and control systems.

The Defence Minister is visiting ADE to address the inaugural session of the Air Force's National Conclave at the Yelahanka Air Base in Bengaluru.

Last week Mr Singh underlined the government's goal of making India a leader in the defence sector, "from design to production and export, with the active participation of public and private sectors".

Mr Singh said the government had set the defence sector a target of ₹ 1,75,000 crore turnover by 2024; this includes exports to the value of ₹ 35,000 crore.

He made the remark while launching seven new PSUs that will operate in this sector, and have already been given 66 contracts worth ₹ 65,000 crore from the armed forces.

In February the government also confirmed a ₹ 45,696 crore deal to buy 73 Tejas LCA and 10 trainer aircraft from Bengaluru's Hindustan Aeronautics Limited. These would become "a potent platform to meet the operational requirements of the Indian Air Force", the government said.

The Tejas Mk-1A LCA is an indigenously designed and manufactured fourth-generation fighter with critical operational capabilities that include an Active Electronically Scanned Array (AESA) radar, an Electronic Warfare (EW) suite, and is capable of air-to-air refueling (AAR).

It also has Beyond Visual Range Missile capabilities and Air-to-Ground weapons.

https://www.ndtv.com/india-news/tejas-light-combat-aircraft-rajnath-singh-amazing-rajnath-singh-after-experiencing-tejas-lca-flight-simulator-2584044

Sat, 23 Oct 2021

रक्षा मंत्री राजनाथ सिंह ने सिम्युलेटर के जरिए तेजस में भरी उड़ान, अनुभव को बताया अद्भुत

केंद्रीय रक्षा मंत्री राजनाथ सिंह दो दिनों की यात्रा पर बेंगलुरु पहुंचे हैं। इस दौरान आज उन्होंने वैमानिकी विकास प्रतिष्ठान (एडीई) का दौरा किया।

केंद्रीय रक्षा मंत्री राजनाथ सिंह दो दिनों की यात्रा पर बेंगलुरु पहुंचे हैं। इस दौरान आज यानी शुक्रवार को उन्होंने वैमानिकी विकास प्रतिष्ठान (एडीई) का दौरा किया। इस प्रतिष्ठान में वे देश में बने हल्के लड़ाकू विमान तेजस के सिम्युलेटर में बैठकर उड़ान भरी। उन्होंने अपने इस अनुभव को अद्भुत बताया है। उन्होंने ट्वीट कर इसकी जानकारी दी। उन्होंने ट्वीट किया, बेंगलुरु स्थित वैमानिकी विकास प्रतिष्ठित (एडीई) में एलसीए तेजस सिम्युलेटर में उड़ान भरने का अनुभव अद्भुत था।

सिम्युलेटर में बैठे रक्षा मंत्री राजनाथ सिंह

ट्वीट के साथ उन्होंने उड़ान भरते हुए एक फोटो भी शेयर किया जिसमें वो सिम्युलेटर के कोकपिट में बैठे दिखाई दे रहे हैं। वहीं उनके साथ एक पायलट भी है जिसके हाथ में सिम्युलेटर को कंट्रोल करने का कमान है। सिम्युलेटर के डिस्पले में विमान की ऊंचाई और अन्य आंकड़े दिखाई दे रहे हैं। बता दें कि यह प्रतिष्ठान सशस्त्र बलों के लिए मानव रहित यान और अन्य हवाई प्रणालियां विकसित करने का काम करता है।

वहीं, बेंगलुरु के येलहंका वायुसेना कनक्लेव के उद्घाटन में रक्षा मंत्री राजनाथ सिंह ने कहा, "1971 का युद्ध और इसमें भारतीयों की जीत जितनी खास है इस युद्ध का आधार भी उतना ही खास है। ये इतिहास के उन कुछ युद्धों में से एक है जो न किसी जमीन के लिए, न किसी आसमान पर हक जमाने के लिए, न किसी तरह की सत्ता के लिए, इस युद्ध के पीछे लक्ष्य था मानवता और लोकतंत्र की गरिमा की सुरक्षा।"

वहीं, बेंगलुरू दौरा पर गए राजनाथ सिंह ने बीते दिन यानी गुरुवार को कहा था कि रक्षा उत्पादों के निर्यात को बढ़ावा हमारी क्षमता और मानक में वृद्धि है। उन्होंने कहा कि मुझे आपको यह बताते हुए खुशी हो रही है कि स्टॉकहोम इंटरनेशनल पीस रिसर्च इंस्टीट्यूट 2020 की रिपोर्ट के मुताबिक, भारत पहली बार शीर्ष 25 रक्षा उत्पादों के निर्यातक देशों की सूची में शामिल है। साथ ही उन्होंने कहा कि रक्षा उत्पादों के निर्यात को बढ़ावा देने और भारत को वैश्विक रक्षा आपूर्ति चेन का हिस्सा बनाने के उद्देश्य से हमने 2024-25 तक एयरोस्पेस और रक्षा सामान और सेवाओं में 35,000 करोड़ रुपये के निर्यात का लक्ष्य निर्धारित किया है।"

https://www.abplive.com/news/india/defence-minister-rajnath-singh-experience-of-flying-in-lca-tejas-simulator-at-the-aeronautical-development-establishment-in-bengaluru-1986073

The EurAsian Times

Sun, 24 Oct 2021

BrahMos-II Missile: How India's Hypersonic Missile program will get a 'Big Boost' from Russian technology?

By Prakash Nanda

Russia's successful test launch of a new Zircon hypersonic cruise missile on July 19 has many strategic implications. One of these could be termed as good news for India as it will hasten the development of the delayed BrahMos-II hypersonic cruise missile, a joint India-Russia project.

The BrahMos-II is very similar to the Zircon. As a winged, anti-ship hypersonic cruise missile, Zircon is a tactical weapon, designed to be carried by frigates of the Russian Navy as well as submarines.

The missile reportedly has a maximum range of 1,000 kilometers, with a flight speed of nearly Mach 7 (and as has been tested, it can go up to Mach 8). It is also spelled as Tsirkon and known as 3M22 in Russia and as the SS-N-33 by the NATO countries.

Zircon hypersonic cruise missile being fired from the Admiral Gorshkov.

If the information that in one of the trials it gathered the speed of Mach 8 is correct, the Zircon missile is the fastest in the world, making it nearly impossible to defend against due to its speed alone.

Another valuable aspect of the missile is its plasma cloud. During its flight, the missile is completely covered by a plasma cloud that absorbs any rays of radio frequencies and makes the missile invisible to radars. This allows the missile to remain undetected on its way to the target.

Prelude to BrahMos-II

Although India test-fired its first indigenous Hypersonic Technology Demonstrator Vehicle (HSTDV), developed by the Defence Research and Development Organisation (DRDO), in August last year, knowledgeable sources say that this is related to the making of the BrahMos-II, which is supposed to succeed the Indian Navy's BrahMos anti-ship missile.

BrahMos is also supersonic, flying at 3 times the speed of sound, known as Mach 3. But BrahMos II, like Zircon, will be about twice as fast, flying at speeds in excess of Mach 6. Though expected to have a range of 600 km, BrahMos II can develop the range to 1,000 km and the speed of Mach 8, it is said. However, its scheduled testing was to be held in 2020. Things have been delayed.

The BrahMos series is being developed by the BrahMos Aerospace Private Limited, the joint collaboration of India's DRDO and Russia's NPO Mashinostroyenia (NPOM). The Zircon has been designed by none other than the NPOM.

What is noteworthy is that though it is supposed to carry conventional warheads, Zircon can be fitted with nuclear warheads if the need arises. Whether BrahMos II will be allowed to carry nuclear warheads remains unclear.

Hypersonic Weapons

It is said that if hypersonic weapons are to be conventionally armed, they need to require greater accuracy for having the greatest impact on the enemy and will be thus more technically challenging to develop than a nuclear-armed system. A nuclear-armed glider is believed to be effective if it were 10 or even 100 times less accurate [than a conventionally-armed glider] due to nuclear blast effects.

The importance of the likes of Zircon lies in the fact that they could enable "responsive, long-range, strike options against distant, defended, and/or time-critical threats [such as road-mobile missiles] when other forces are unavailable, denied access, or not preferred."

Secondly, they could challenge detection and defense due to their speed, maneuverability, and low-altitude of flight. And by the time they are detected, they would have already covered such a big distance because of their speed, the interceptor missiles will not be able to fly fast enough to catch up.

Thirdly, analysts point out that developing defense systems against hypersonic missiles will prove to be very costly.

As physicist and nuclear expert James Acton explains, "Point-defense systems, and particularly [Terminal High-Altitude Area Defense (THAAD)], could very plausibly be adapted to deal with hypersonic missiles. The disadvantage of those systems is that they can only defend small areas. To defend the whole of the continental United States, you would need an unaffordable number of THAAD batteries."

However, all told, the analysts also caution that hypersonic cruise missiles may not be used against countries possessing intercontinental ballistic missiles (ICBM) in their heartlands. For instance, if Russia manages to use a missile such as Zircon against the United States, the latter can retaliate massively with ICBMs.

This, perhaps, explains, why the US has not developed, as of now, a known hypersonic system, though its three services and the Defense Advanced Research Projects Agency (DARPA) of the Department of Defense are working on their respective hypersonic programs.

Threat to American Carriers?

The US Navy is requesting $1.4 billion in FY2022. The US Army wants $301 million for the program in FY2022. The US Air Force has requested similarly $691 million for the various segments of the program. DARPA's demand for similar purposes $411 million.

All these organizations are being funded by the Department of Defense for a number of hypersonic weapons programs, the US has not established any program of record, leading experts to suggest that the US may not have approved requirements for hypersonic weapons or long-term funding plans. There is a school of thought which argues that Russia has developed Zircon as a means of contending with American superiority in size, technology, and the sheer number of aircraft carriers. At the moment, the US Navy has 12 nuclear-powered aircraft carriers, whereas Russia has only one.

Therefore, it is said that "while at sea, any of Russia's 15 Buyan–class corvettes will be able to carry up to 25 Zircon hypersonic missiles. It would take fewer than a half-dozen of those missiles to sink even the most advanced American aircraft carrier, such as the USS Gerald R. Ford".

In fact, aircraft carriers are believed to be the principal targets of hypersonic missiles like Zircon. It is argued that these missiles may not be actually applied against carriers, but their possession creates such apprehensions about their vulnerability in the minds of nations with carriers that they do not use these huge platforms assertively and effectively.

The huge value or costs of the carriers may become their greatest weakness against these much cheaper missiles. No nation will like the loss of the carriers (many cannot afford to lose them), so they are forced to remain effectively on the sidelines "in case of high-intensity, peer-competitor conflict."

This is not to suggest that aircraft carriers will become obsolete in the face of hypersonic missiles but to underline the dangers they face from advanced military technology. And this brings to one's attention how important the BrahMos II could be for India in meeting the challenge of the rising naval capabilities of China in the Indo-Pacific, particularly the Indian Ocean region.

China is about to have at least three aircraft carriers and a host of large destroyers, frigates, and submarines. India's hypersonic anti-ship missiles will be effective counters in that regard.

https://eurasiantimes.com/indias-hypersonic-brahmos-ii-missile-program-russian-zircon-missile/

The EurAsian Times

Sat, 23 Oct 2021

India could deploy hypersonic missiles earliest by 2025; likely to be modelled on Russian Zircon – US Report

By Kashish Tandon

India and Russia have collaborated for developing an advanced version of the BrahMos cruise missile, modeled on the latter's Zircon hypersonic weapon and could be deployed earliest by 2025.

An India-Russia joint venture, the BrahMos is considered the world's fastest supersonic cruise missile, which can fly at a speed of Mach 3, or three times the speed of sound. India has inducted this weapon for use on tri-services platforms.

A BrahMos II model on display.

Like the rest of the superpowers, India too has now joined the race to develop hypersonic weapons. The country has developed a hypersonic technology demonstrator vehicle (HSTDV) and tested a Mach 6 scramjet in June 2019 and in September 2020.

The HSTDV had been developed by India's Defence Research and Developmental Organisation (DRDO). According to experts, this test-firing was related to the making of the BrahMos II hypersonic missile. This new missile is likely to complement the Indian Navy's existing BrahMos anti-ship missile.

What Is BrahMos II?

The BrahMos II is twice as fast and can reach a speed of over Mach 6. Even though the missile is expected to have a range of 600 km, experts claim that the BrahMos II, which is similar to Russia's Zircon hypersonic missile, can exceed its range of 1000 km and can fly at a speed as high as Mach 8.

BrahMos Aerospace is a joint venture between India and Russia. While DRDO represents India, NPO Mashinostroyenia represents Russia in it. The Zircon missile has been developed by NPOM.

According to the latest report by the Congressional Research Service (CRS), a US Congress think tank, India is among one of the selected few countries which are developing hypersonic weapons.

The report which came out this week said that although the US, Russia, and China have one of the most advanced hypersonic weapons programs, several other countries such as India, Australia, France, Germany, and Japan are underway in developing hypersonic weapons technology.

The BrahMos II was originally scheduled to be fielded in 2017. However, it faced significant delays and is now expected to achieve initial operational capability between 2025 and 2028, according to various reports.

India has around 12 operational hypersonic wind tunnels and can test hypersonic weapons with a speed of up to Mach 13, according to the CRS report.

The Hypersonic Arms Race

Earlier this week, The Financial Times reported that China had conducted a test for hypersonic missiles. However, these claims were denied by China as it said that the country had only tested a hypersonic vehicle and not a nuclear-capable hypersonic missile, according to the British newspaper which also said that the missile missed its target by approximately 12 miles.

The FT report stated that China had tested a nuclear-capable hypersonic missile, which circled the Earth before speeding towards its target. This demonstrated China's advanced space capability and caught US intelligence agencies by surprise.

Meanwhile, according to the CRS, Australia has collaborated with the US for the Hypersonic International Flight Research Experimentation (HiFiRE) program for developing hypersonic technologies since the year 2007.

A HiFiRE test was successfully conducted in July 2017 to evaluate the flight dynamics of a Mach 8 hypersonic glide vehicle. The previous HiFiRE tests explored scramjet engine technologies. Its successor, the Southern Cross Integrated Flight Research Experiment (SCIFiRE), has been put in place for developing hypersonic air-breathing capabilities. Demonstration tests of the SCIFiRE may be scheduled for mid-2020s.

Similarly, France has collaborated with Russia for developing hypersonic technology while Japan is developing the Hypersonic Cruise Missile (HCM) and the Hyper Velocity Gliding Projectile (HVGP).

In the past few years, the US has focused its efforts on developing hypersonic glide vehicles, which are launched from a rocket before gliding to a target, and hypersonic cruise missiles, powered by high-speed, air-breathing engines during flight.

The US Department of Defense (DoD) has been working towards developing hypersonic weapons under the Navy's Conventional Prompt Strike Program. This program is expected to provide the US military with the ability to strike hardened or time-sensitive targets with the help of conventional warheads.

According to the CRS, contrary to the hypersonic programs of China and Russia, the US hypersonic weapons are going to be conventionally armed. Due to this, the US hypersonic weapons will require greater accuracy and their development will be more technically challenging than the nuclear-armed Russian and Chinese systems.

https://eurasiantimes.com/india-hypersonic-missile-2025-russian-zircon/

The Sentinel
of this land, for its people

Mon, 25 Oct 2021

Indian Army deploys Pinaka Rocket System in Assam to counter Chinese threat

The Pinaka weapon system has been named after the bow of Lord Shiva and has been designed to counter area targets by firing various ammunitions such as high explosives and submunitions

Guwahati: The Pinaka and Smerch Multiple Rocket Launcher Systems (MRLS) have been deployed in Assam by the Indian Army at forward position near the China border as a measure against any Chinese threat that may arise on the Line of Actual Control (LAC).

As an autonomous rocket artillery system, the Pinaka weapon system can engage area targets up to 38km at mean sea level. The ranges of the weapon system are highly enhanced at such altitudes which further increase the deep strike capability of the weapon system.

A battery of six launchers of Pinaka can neutralise an area of 1000m by 800m by firing a salvo of 72 rockets in just 44 seconds.

Speaking to ANI, Lieutenant Colonel Sarath who is the deployed battery commander at the location, gave an overview of the weapon system and said, "The Pinaka weapon system is indigenous multi rocket launcher system designed by Defence Research and Development Organisation (DRDO) and it is a state of art, completely autonomous weapon system, which can engage targets up to 38 kilometres at mean sea level and at higher altitudes, the ranges get significantly enhanced, which subsequently enhance our deep strike capability."

Explaining the advantages of Pinaka and Smerch, he added, "The quick reaction time and the high accuracy of these weapon systems ensure delivery of a very high volume of firepower on critical and time-sensitive enemy targets in a very short time."

The Smerch system has a maximum range of 90 Km and is the longest range conventional rocket system that exists in the inventory of the Indian army. A battery of four launchers can neutralise an area of 1200m by 1200m by firing a salvo of 48 rockets in 40 seconds.

Speaking about the features of Smerch, its battery commander Major Srinath said, "The launcher is a very potent weapon in the arsenal of Indian artillery. The weapon can fire up to a range of 90 kilometres. Being based on a 10 by 10 tatra, it's extremely mobile, and there is no issue with mobility in any sort of terrain. There are 12 tubes in the cluster, and it fires 12 rockets in a span of 40 seconds."

The Pinaka weapon system has been named after the bow of Lord Shiva and has been designed to counter area targets by firing various ammunitions such as high explosives and submunitions.

https://www.sentinelassam.com/north-east-india-news/assam-news/indian-army-deploys-pinaka-rocket-system-in-assam-to-counter-chinese-threat-560275

india.com

Sat, 23 Oct 2021

Indian Army displays Pinaka and Smerch Multiple Rocket Launcher Systems in Assam

Pinaka is a multibarrel rocket launch (MBRL) system. It has been developed by the Defence Research and Development Organisation (DRDO)

Edited By Analiza Pathak

Guwahati: The Indian Army on Friday displayed the Pinaka and Smerch multiple rocket launcher systems in Assam. These systems ensure the delivery of a very high volume of firepower in a short span, an official said.

Indian Army Displays Pinaka And Smerch Multiple Rocket Launcher Systems In Assam (video grab)

"Pinaka and Smerch multi rocket launcher systems are designed to fire a variety of ammunition. Quick reaction time and higher accuracy of these systems ensure delivery of very high volume of firepower on critical and time-sensitive enemies in a short time," ANI quoted Lt Col Sarath, Battery Commander, as saying.

Pinaka is a multibarrel rocket launch (MBRL) system. It has been developed by the Defence Research and Development Organisation (DRDO). The system integrates state-of-the-art technologies for delivering superior combat performance.

The Smerch launcher is a very potent weapon in the arsenal of the Indian artillery. It can fire up to the range of 90km. It can fire 12 rockets in 40 seconds, Major Srinath, Battery Commander tola ANI.

An advanced version of the DRDO-developed Pinaka rocket was successfully flight tested from Integrated Test Range, Chandipur off the coast of Odisha, November 4, 2020.

https://www.india.com/news/india/watch-indian-army-displays-pinaka-and-smerch-multiple-rocket-launcher-systems-in-assam-5064777/

जागरण

Sat, 23 Oct 2021

चीन को करारा जवाब देने के लिए तैयार भारत, सेना ने एलएसी पर तैनात किए Pinaka और Smerch

भारतीय सेना ने वास्तविक नियंत्रण रेखा (एलएसी) पर किसी भी खतरे का मुकाबला करने के लिए चीन सीमा के पास फारवर्ड पोजिशन पर पिनाका और स्मर्च मल्टीपल राकेट लांचर सिस्टम को तैनात किया है। पढ़ें यह रिपोर्ट

By Krishn Bihari Singh

गुवाहाटी: पूर्वी लद्दाख और उत्तराखंड के बाद अब पूर्वोत्तर में भी एलएसी पर चीन की आक्रामकता का करारा जवाब देने की तैयारी है। समाचार एजेंसी एएनआइ की रिपोर्ट के मुताबिक, भारतीय सेना ने वास्तविक नियंत्रण रेखा (एलएसी) पर किसी भी खतरे का मुकाबला करने के लिए चीन सीमा के पास फारवर्ड पोजिशन पर पिनाक और स्मर्च मल्टीपल राकेट लांचर सिस्टम को तैनात किया है। हाल ही में सेना ने अरुणाचल प्रदेश में एलएसी पर अपनी तैनाती बढ़ाई थी। पूर्वी लद्दाख में भी सेना की ओर से भारी हथियारों को तैनात किया जा चुका है।

44 सेकंड में 72 राकेट फायर करने की क्षमता

पिनाक हथियार प्रणाली एक स्वायत्त राकेट आर्टिलरी सिस्टम है। औसत समुद्र तल पर यह 38 किलोमीटर तक अपने लक्ष्य को भेद सकती है लेकिन इतनी ऊंचाई पर इसकी मारक क्षमता और बढ़ जाती है। ऊंचाई वाले सीमाई क्षेत्र में ऐसी तैनाती का मकसद सेना की आपरेशनल क्षमताओं को मजबूती देना है। समाचार एजेंसी एएनआइ की रिपोर्ट के मुताबिक पिनाक के छह लांचरों की एक बैटरी 44 सेकंड में 72 राकेटों का सैल्वो फायर कर सकती है। इससे 1000 x 800 मीटर के दायरे को निष्कृय कर सकती है।

डीआरडीओ ने किया है डिजाइन

इस हथियार प्रणाली की तैनाती के बारे में बात करते हुए बैटरी कमांडर लेफ्टिनेंट कर्नल सरथ ने समाचार एजेंसी एएनआई को बताया कि पिनाक हथियार प्रणाली रक्षा अनुसंधान और विकास संगठन (डीआरडीओ) द्वारा डिजाइन किया गया स्वदेशी मल्टी राकेट लॉन्चर सिस्टम है। यह अत्याधुनिक और पूरी तरह से स्वायत्त हथियार प्रणाली है। यह समुद्र तल से 38 किलोमीटर तक के लक्ष्य को भेद सकती है। ऊंचाई पर इसकी मारक क्षमता और कारगर हो जाती है। इसकी तैनाती से सेना की स्ट्राइक क्षमता में काफी बढ़ोतरी हुई है।

भारी गोलाबारी करने में सक्षम

भारत की मारक क्षमता में पिनाक और स्मर्च के योगदान के बारे में बताते हुए कर्नल सरथ ने कहा कि यह हथियार प्रणाली त्वरित प्रतिक्रिया और बेहद कम समय में महत्वपूर्ण और उच्च सटीकता के साथ दुश्मन के ठिकानों पर भारी गोलाबारी करने में सक्षम है। स्मर्च हथियार प्रणाली सेना की सबसे लंबी दूरी की पारंपरिक राकेट प्रणाली है, जिसकी अधिकतम मारक क्षमता 90 किलोमीटर तक है। इसकी चार लांचरों की एक बैटरी महज 40 सेकंड में 48 राकेटों का सैल्वो फायर कर सकती है। यह 1200 मीटर तक के क्षेत्र में सब कुछ ध्वस्त कर देती है।

बढ़ जाएगी सेना की मारक क्षमता

इसका नाम भगवान शिव के धनुष पिनाक के नाम पर रखा गया है। इन दोनों हथियार प्रणालियों (पिनाक और स्मर्च) को दुश्मन पर विभिन्न प्रकार के गोला-बारूद को फायर करने के लिए डिजाइन किया गया है। पिनाक के उन्नत संस्करण का भी उत्पादन किया जा रहा है जिसकी मारक क्षमता 75 किलोमीटर तक होगी। इससे सेना की मारक क्षमता कई गुना बढ़ जाती है। हाल ही में भारतीय सेना ने चीन से लगी सीमाओं पर दूसरे घातक हथियारों को भी तैनात किया है।

https://www.jagran.com/news/national-india-deploys-pinaka-and-smerch-rocket-system-on-lac-at-china-border-22139003.html

जागरण

Sat, 23 Oct 2021

कारगिल के बाद चीन को मुंह तोड़ जवाब देगा पिनाक, 44 सेकेंड में दागेगा 72 राकेट, जानें अन्य खूबियां

कारगिल युद्ध के बाद पूर्वी लद्दाख और एलएसी पर चीन की आक्रामकता का करारा जवाब देने के लिए भारतीय सेना ने पिनाक राकेट सिस्टम को तैनात किया है। आइए जानते हैं कि आखिर क्या है पिनाका राकेट सिस्टम। क्या हैं इसकी खूबियां।

By Ramesh Mishra

नई दिल्ली: कारगिल युद्ध के बाद पूर्वी लद्दाख और एलएसी पर चीन की आक्रामकता का करारा जवाब देने के लिए भारतीय सेना ने पिनाक राकेट सिस्टम को तैनात किया है। समाचार एजेंसी एएनआइ की रिपोर्ट के मुताबिक भारतीय सेना ने वास्तविक नियंत्रण रेखा (एलएसी) पर किसी भी खतरे से निपटने के लिए चीन सीमा के पास पिनाका लांचर सिस्टम को तैनात किया है। आखिर क्या है पिनाक राकेट सिस्टम। क्या हैं इसकी खूबियां।

क्या है पिनाक की खूबियां

- दरअसल, पिनाक एक फ्री फ्लाइट आर्टिलरी राकेट सिस्टम है। उन्नत पिनाक राकेट सिस्टम 45 किमी तक की दूरी पर स्थित लक्ष्य को भेदने में सक्षम है। पिनाक राकेट्स को मल्टी-बैरल राकेट लांचर से छोड़ा जाता है। लांचर सिर्फ 44 सेकेंड्स में 72 राकेट्स दाग सकता है। भगवान शिव के धनुष 'पिनाक' के नाम पर इसका नामकरण हुआ। इसे भारत और पाकिस्तान से लगी सीमाओं पर तैनात करने के मकसद से बनाया गया है।
- पिनाक एक लंबी दूरी का आर्टिलरी सिस्टम है। इसे नजदीक से युद्ध होने से पहले दुश्मन को टारगेट करने के लिए प्रयोग किया जाता है। इससे छोटी रेंज की आर्टिलरी, इन्फैंट्री और हथियारबंद वाहनों को निशाना बनाया जाता है। इस सिस्टम के पूर्व भारत के पास राकेट्स दागने के लिए 'ग्राड' नाम का रूसी सिस्टम हुआ करता था। हालांकि, सेना में अब भी इसका प्रयोग किया जाता है।
- 1980 के दशक में रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) ने पिनाक राकेट सिस्टम को विकसित करना शुरू किया। 1990 के आखिरी दौर में पिनाक मार्क-1 के सफल परीक्षण किया गया। खास बात यह है कि भारत ने करगिल युद्ध के दौरान भी पिनाक का प्रयोग किया था। बाद में पिनाक की कई रेजिमेंट्स बन गईं।
- पिनाक मूल रूप से मल्टी-बैरल राकेट सिस्टम है। पिनाक सिस्टम की एक बैटरी में छह लान्च वेहिकल होते हैं। साथ ही लोडर सिस्टम, रडार और लिंक विद नेटवर्क सिस्टम और एक कमांड पोस्ट होती है। एक बैटरी के जरिए एक किलोमीटर एरिया को पूरी तरह ध्वस्त किया जा सकता है। मार्क-I की रेंज करीब 40 किमी है, जबकि मार्क-II से 75 किलोमीटर दूर तक निशाना साधा जा सकता है।

गाइडेड मिसाइल की तरह तैयार किया गया मार्क-II

पिनाक राकेट का मार्क-II वर्जन को एक गाइडेड मिसाइल की तरह तैयार किया गया है। इसकी क्षमता को बढ़ाने के लिए इसमें नेविगेशन, कंट्रोल और गाइडेंस सिस्टम जोड़ा गया है। इससे इस मिसाइल की मारक क्षमता अत्यधिक सटीक है यानी इसका निशाना अचूक होता है। मिसाइल का नेविगेशन सिस्टम सीधे इंडियन रीजनल नेविगेशन सैटेलाइट सिस्टम से जोड़ा गया है।

'शूट ऐंड स्कूट' की रणनीति

आर्टिलरी गन्स के मुकाबले में राकेट्स की एक्युरेसी कम होती है। हालांकि मार्क-II में गाइडेंस और नेविगेशन सिस्टम लगने से वह कमी पूरी हो गई है। इसके साथ ही युद्ध के समय राकेट लान्चर्स को 'शूट ऐंड स्कूट' की रणनीति अपनानी पड़ती है। यानी एक बार टारगेट पर फायर करने के बाद वहां से हट जाना होता है ताकि वे खुद निशाना न बन जाएं। लान्चर वेहिकल की मैनुवरेबिलिटी बहुत अच्छी होनी चाहिए। पिनाक इस पैमाने पर खरा उतरता है।

https://www.jagran.com/news/national-after-kargil-pinaka-will-give-a-befitting-reply-to-china-will-fire-12-rockets-in-44-seconds-know-other-features-jagran-special-22139408.html

THE TIMES OF INDIA

Sat, 23 Oct 2021

Uttar Pradesh cabinet OKs land for BrahMos unit in state capital

Lucknow: The state cabinet on Friday paved the way for setting up a defence unit to manufacture 'BrahMos' in the Lucknow node of the defence corridor by clearing a proposal to allot 80 hectares of land for a token Re 1 annual lease rent.

The unit would come up in the Sarojininagar area of the city. The cabinet also cleared the proposal for direct bank transfer of cash to students of classes 1 to 8 to purchase school uniforms, books, sweaters, socks and shoes. The cabinet approved the easing of rules of the UP Defence and Aerospace Unit and Employment Generation Policy of 2018.

Cabinet clears Rs 1,800cr proposal for bank transfer to schoolkids for uniformIt will allow easy allotment of land to two projects which will be setting up facilities in UP's upcoming defence corridor. While the one unit would manufacture Brah-Mos missiles, the other unit would manufacture propulsion systems used in Akash missiles.

Under the change in the defence policy, Bharat Dynamics Ltd is being given a 25% concession in price of land and allotment of 183 hectare land at a token annual lease rent of Re 1. The company is planning to set up a unit in the Jhansi node of the defence corridor where it will use indigenous technology to manufacture propulsion systems used in the Akash Missiles and will be investing Rs 400 crore in the project and provide employment to about 100 people.

Additionally, 80 hectare land is being given for free and at a token annual lease rate of Re 1 to DRDO under the defence ministry in the Lucknow node of the defence corridor. DRDO would be investing Rs 9,300 crore in this project over the next 5-7 years. It will employ about 500 engineers and technical staff in addition to generating 1,500 indirect jobs.

Like other units eligible under the policy, both companies will also get a 100% concession in stamp duty.

The Cabinet also approved of Rs 1,800 crore to be paid to more than 1.60 crore students of classes 1 to 8 of government and aided schools in lieu of free uniforms, sweaters, shoes, socks and school bags for the financial year 2021-22. The online transfer of funds will allow for an audit trail and students will also be able to purchase all essentials at one go.

Amendments have been approved in the Agriculture Export Policy-2019. Under this, there is provision to have a minimum of 50 hectare agricultural land in a development block and farmers will get the benefits of the policy reserved for clusters.

The transport concession through water route has been increased from Rs 5 per kg port to Rs 10 and rail routes have also been incorporated in it.

https://timesofindia.indiatimes.com/city/lucknow/uttar-pradesh-cabinet-oks-land-for-brahmos-unit-in-state-capital/articleshow/87216795.cms

नवभारत टाइम्स

Sat, 23 Oct 2021

डीआरडीओ को 80 हेक्टेयर और बीडीएल को 183 हेक्टेयर भूमि आवंटित करने के प्रस्ताव को मंजूरी

लखनऊ: उत्तर प्रदेश मंत्रिपरिषद ने राष्ट्रीय सुरक्षा एवं रक्षा क्षेत्र में स्वदेशी तकनीक के विकास के लिए उत्तर प्रदेश रक्षा तथा एयरोस्पेस इकाई एवं रोजगार प्रोत्साहन नीति-2018 (यथासंशोधित) के प्रावधानों में ढील देने के प्रस्ताव को मंजूरी दी है तथा उसने डीआरडीओ को 80 हेक्टेयर तथा भारत डायनामिक्स लिमिटेड (बीडीएल) को 183 हेक्टेयर भूमि एक रुपये के टोकन वार्षिक पट्टा किराये पर दिये जाने के प्रस्ताव को मंजूरी दे दी है।

शुक्रवार को जारी सरकारी बयान के अनुसार मुख् यमंत्री योगी आदित्यनाथ की अध्यक्षता में संपन्न हुई मंत्रिपरिषद की बैठक में रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) के पक्ष में 80 हेक्टेयर भूमि निःशुल्क एक रुपये के टोकन वार्षिक पट्टा किराये पर दिए जाने को मंजूरी दी गयी। साथ ही, इस नीति के तहत औद्योगिक इकाइयों की तरह डीआरडीओ ब्रह्मोस को भूमि क्रय पर 100 प्रतिशत की स्टाम्प ड्यूटी से छूट दिये जाने के प्रस्ताव को स्वीकृति प्रदान कर दी गयी है।

इस परियोजना के लिए उत्तर प्रदेश रक्षा औद्योगिक गलियारा के अन्तर्गत आवंटित किये जाने हेतु तहसील सरोजनी नगर में 80 हेक्टेयर भूमि चिन्हित की गई है। ब्रह्मोस उत्तर प्रदेश डिफेंस इण्डस्ट्रियल कॉरिडोर के लखनऊ नोड में स्वदेशी तकनीक से विकसित होने वाली उच्च तकनीक की मिसाइल होगी।

गौरतलब है कि देश की रक्षा में विदेशी निर्भरता कम करने, स्वदेशी तकनीकी के विकास तथा रक्षा उपकरणों एवं उससे सम्बन्धित अन्य सामग्री क्रय में कमी लाने के दृष्टिगत डीआरडीओ ब्रह्मोस-एनजी एयरोस्पेस परियोजना एक महत्वपूर्ण कदम है। इसके निर्माण से देश की न केवल सैन्यशक्ति मजबूत होगी अपितु राष्ट्रीय सुरक्षा को भी बल मिलेगा, जिसमें उत्तर प्रदेश की अग्रणी भूमिका होगी। इस परियोजना के अन्तर्गत डीआरडीओ द्वारा पांच से सात वर्षों में कुल 9,300 करोड़ रुपये का निवेश किया जाएगा तथा लगभग 500 इंजीनियर एवं तकनीकी लोगों को प्रत्यक्ष रोजगार तथा 1500 से अधिक लोगों को अप्रत्यक्ष रोजगार प्राप्त होने की सम्भावना है।

इसके अलावा मंत्रिपरिषद ने राष्ट्रीय सुरक्षा एवं रक्षा क्षेत्र में स्वदेशी तकनीक के विकास के लिए उत्तर प्रदेश रक्षा तथा एयरोस्पेस इकाई एवं रोजगार प्रोत्साहन नीति-2018 (यथासंशोधित) के प्रावधानों को शिथिल बनाते हुए भारत डायनामिक्स लिमिटेड (बीडीएल) के पक्ष में भूमि का आवंटन, भूमि के सकल विक्रय मूल्य का 25 प्रतिशत धनराशि की छूट के साथ, 183 हेक्टेयर भूमि एक रुपये के टोकन वार्षिक लीज रेन्ट पर दिये जाने तथा इस नीति में पात्र औद्योगिक इकाइयों की तरह भारत डायनामिक्स लिमिटेड (बीडीएल) को भूमि क्रय पर 100 प्रतिशत की स्टाम्प ड्यूटी से छूट दिये जाने के प्रस्ताव को स्वीकृति प्रदान कर दी है।

भारत डायनामिक्स लिमिटेड (बीडीएल) उत्तर प्रदेश डिफेंस इण्डस्ट्रियल कॉरिडोर के झांसी नोड में स्वदेशी तकनीक से रक्षा क्षेत्र में आकाश मिसाइल में प्रयुक्त होने वाले प्रणोदन प्रणाली (किसी वस्तु को गति देने के लिए लगाये गये बल का उत्पादन करने का साधन) निर्माण सुविधा की स्थापना करेगी।

इसके निर्माण से देश की न केवल सैन्य शक्ति मजबूत होगी अपितु राष्ट्रीय सुरक्षा को भी बल मिलेगा, जिसमें उत्तर प्रदेश राज्य की अग्रणी भूमिका होगी।

इस परियोजना के अन्तर्गत भारत डायनामिक्स लिमिटेड (बी0डी0एल0) द्वारा कुल 400 करोड़ रुपये का निवेश प्रस्तावित किया गया है। इस उपक्रम के द्वारा 100 लोगों को प्रत्यक्ष रोजगार दिए जाने की सम्भावना है। इसके अतिरिक्त, इससे अनेक सूक्ष्म, लघु एवं मध्यम इकाइयों की स्थापना के अवसर प्राप्त होंगे तथा उत्तर प्रदेश राज्य को विभिन्न करों के रूप में राजस्व की प्राप्ति होगी।

https://navbharattimes.indiatimes.com/metro/lucknow/other-news/approved-the-proposal-to-allot-80-hectares-to-drdo-and-183-hectares-to-bdl/articleshow/87213165.cms

THE HINDU

Mon, 25 Oct 2021

VEM Tech to set up ₹1,000 crore integrated defence factory in Sangareddy

To also serve as a defence export processing zone to cater to the overseas market

Hyderabad: VEM Technologies, the city-based firm that became the first private sector unit to make a central fuselage for Light Combat Aircraft (LCA) Tejas being manufactured by Hindustran Aeronautics Limited (HAL), is scaling up its defence manufacturing capabilities by setting up a ₹1,000 crore integrated defence facility at Yelgoi near Zaheerabad in Sangareddy.

IT principal secretary Jayesh Ranjan shaking hands with VEM Technologies CMD Venkata Raju after signing the MoU in Hyderabad on Sunday. Also seen are MA&UD Minister K.T. Rama Rao, member of Niti Aayog V.K. Saraswat and DRDO chairman Satheesh Reddy.

Spread over 511 acres, this exclusive defence factory, to come up in the next five years, will be involved in making next generation weapon systems end-to-end, including missiles, radars, seekers, engines, avionics, fighter planes, helicopters and the likes, employing close to 2,000 persons. This will also serve as a defence export processing zone to cater to the overseas market, said VEM Technologies Chairman and Managing Director V. Venkata Raju on Sunday.

A Memorandum of Understanding (MoU) with the State government was signed by Mr. Raju in the presence of IT and Industries Minister K.T. Rama Rao, DRDO Chairman G. Satheesh Reddy, Niti-Aayog member V.K. Saraswat, TS Industrial Infrastructure Corporation (TSIIC) VC and MD E.V. Narasimha Reddy and IT secretary Jayesh Ranjan. Dr. Reddy, also secretary of the department of defence R&D, said that the government was keen on opening up the entire defence production for the private sector and an entire missile weapons system to be made by the latter. Akash Missile being manufactured by BDL has 85% private sector contribution with several 'tier 2 and tier 3' contributing.

'More orders coming'

"This is an ideal scenario where we want small scale sector to contribute and not large monopolies. Hyderabad is going to be the centre for several production facilities, including anti-drone technologies, electronic warfare and others, with at least ₹1 lakh crore orders coming by as more key technologies will be transferred by the ministry," he said.

Mr. Raju stated that aerospace and defence company currently functions from two locations — for design and development and manufacturing facilities here. It has been a production partner with defence public sector units like BEL, HAL and others in making various systems for BrahMos, LRSAM/MRSAM, Astra missiles and so on. In fact, it has been working on its own weapon system, ASIBAL – an anti-tank guided missile system.

Mr. Rama Rao hailed the pact and reiterated the government's support for the project and also in establishing the proposed skill development centre at Zaheerabad. The city has become a hub for defence manufacturing over decades with several public and private units established, he pointed out, and called for collaborative efforts between the Centre and State to give impetus to defence sector putting aside 'ideological differences' for the sake of the nation.

Dr. Saraswat recalled the growth of VEM Techologies in the last three decades and expected it to become the aerospace-defence akin to US-based 'Lockheed Martin'. Former Union Defence Minister Pallam Raju was also present.

https://www.thehindu.com/news/cities/Hyderabad/vem-tech-to-set-up-1000-crore-integrated-defence-factory-in-sangareddy/article37152961.ece

Telangana Today

Mon, 25 Oct 2021

Hyderabad to remain hotspot for aerospace, defence manufacturing: KTR

Hyderabad: Several foreign OEMs such as Lockheed Martin, Boeing, GE and Safran, as well as large domestic public sector and private sector companies have chosen Hyderabad for manufacturing and have enabled the creation of over 1,000 MSMEs and micro-enterprises. Highly skilled workforce has also been another major strength of the city's ecosystem that is attracting industry.

Speaking at the MoU signing between VEM Technologies and Telangana government on Sunday for setting up an integrated defence systems facility in Zaheerabad, Telangana Industries minister KT Rama Rao said, "The facility will add value to the aerospace and defence ecosystem of the State. Hyderabad has been and will be the preferred aerospace and defence manufacturing destination."

"As the city grows in the sector, there will be more aerospace and defence orders. DRDO chairman Dr Satheesh Reddy four years back said that almost Rs 1 lakh crore worth of orders will be coming to Hyderabad during the 2017-22 period, and it is happening. We will make sure that the State government will complement the efforts and policies of the Central government and work hand in hand in the development of aerospace and defence industry," KTR added.

Highlighting the upcoming opportunities, Dr G Satheesh Reddy, DRDO chairman, said, "Indian government has opened up missile systems for the private sector. Several new missile orders have been placed and more orders will be placed shortly. This will benefit the industry in Hyderabad. Not just missiles, there is a lot of activity happening in the anti-drone space, where the 'kill' portion is done in the laboratories of private companies in Hyderabad. Anti-drone capabilities are also being built in the city."

He added, "Telangana government has been very proactive and officials are just a call away. This industry-friendly approach is helping build a strong ecosystem for the aerospace and defence sector and make it flourish. DRDO will continue to engage with the companies in the city."

Dr V K Saraswat, Niti Aayog member, said, as the Government of India is looking to privatise several defence systems, Hyderabad and companies such as VEM Technologies will stand to gain, giving scope for creation of India's own Lockheed Martin in the city.

https://telanganatoday.com/hyderabad-to-remain-hotspot-for-aerospace-defence-manufacturing-ktr

mint

Sat, 23 Oct 2021

Army training command ties up with Amity University to open Centre of Excellence

By Prashant K. Nanda

There would be collaborative research in areas of mutual interest like "Physical Sciences, Engineering, Pharmacy, Management, and Social Sciences"

New Delhi: The Army Training Command (ARTRAC) of the Indian Army has joined hands with Amity University to establish a 'Centre of Excellence' for studies in engineering and technology.

As part of the memorandum of understanding, the Army would "sponsor officers to undergo on-campus and off-campus educational programmes". Besides, there would be collaborative research in areas of mutual interest like "Physical Sciences, Engineering, Pharmacy, Management, and Social Sciences". Besides, the faculty and experts exchange will happen between both the organisation boost research and innovation, the university said.

Before the ARTRAC tie-up, Amity had in September partnered Defence Research and Development Organisation (DRDO) to roll out a niche defence technology course to augment human resource pool in the sector and create talent to build start-ups.. Photo: Rames

The centre will also focus on emerging areas of science and technology, including "information warfare or security, wireless communication, robotics, automation, surveillance, underwater acoustics and communication, chemical storage, handling, transport, and disposal" Besides areas like environment and energy system technologies, supply chain management will also get attention.

Indian forces need to adapt new technologies and therefore best of talent from military and civil should come together to create a robust system, army authorities said.

Before the ARTRAC tie-up, Amity had in September partnered Defence Research and Development Organisation (DRDO) to roll out a niche defence technology course to augment human resource pool in the sector and create talent to build start-ups.

"India needs to develop its ecosystem for defense research and has launched several schemes to fund start-ups. Students after completion of this program can make their own R&D startup (As well). The aim is to fight the next war with our weapons," H.B Srivastava, director general-technology management, DRDO, which is the premier R&D wing of the defence ministry had said last month.

India is striving to augment self-reliance in defence technology including missiles, fighter aircraft, drones, naval systems, combat vehicles, radars, sonars, higher energy materials and directed energy systems etc.

https://www.livemint.com/education/news/army-training-command-ties-up-with-amity-university-to-open-centre-of-excellence-11634971786833.html

THE ECONOMIC TIMES

Mon, 25 Oct 2021

Indian researchers working on early landslide detection systems to reduce fatalities, damage

Synopsis

Several groups of researchers in the country are working upon solutions to reduce landslide-induced fatalities by providing early and accurate warnings so that traffic can be stopped on certain routes and people are relocated to safer places in time.

Widespread devastation, numerous road crashes and deaths caused by landslides in several parts of the country throughout the year have turned the spotlight on the urgent need for its early detection or monitoring systems.

Researchers at the Rajiv Gandhi Institute of Technology, Mumbai believe an early warning system can be used to minimize the impact imposed by landslide on human, damage to property and loss of live.

Several groups of researchers in the country are working upon solutions to reduce landslide-induced fatalities by providing early and accurate warnings so that traffic can be stopped on certain routes and people are relocated to safer places in time.

Landslides are the third biggest natural disasters in the world, with India experiencing the biggest bulk of them -- 15 per cent of the country is prone to landslides and India has the highest number of landslide deaths in the world.

According to experts, agencies like Central Road Research Institute (CRRI), Central Building Research Institute (CBRI), Wadia Institute of Himalayan Geology (Dehradun) and defence sector agencies like Boarder Roads Organization (BRO), Defense Research and Development Organization (DRDO), Snow and Avalanche Studies Establishment (SASE) have been carrying out studies to minimise landslide-induced accidents and provide solutions.

Researchers at the Indian Institute of Technology (IIT) Mandi who claim to have developed the cheapest solution for landslide monitoring system across the globe are now experimenting with the same system across railway tracks.

"We have patented a surface-level motion sensor-based early warning system developed by our team. The device gathers information about weather parameters, soil moisture, and soil movement and when it detects a large displacement of soil which could result in a landslide, it sends SMS alerts," Varun Dutt, Associate Professor, IIT Mandi told PTI.

"The sensors alerted officials about an imminent landslide on the Mandi-Jogindernagar highway, which helped the police turn away vehicles from the road before it was washed away. The cost of installing our system is around Rs 80,000 which is the cheapest for such systems across the globe with the usual costs roughly being around Rs 2 crore," he added.

Currently, 13 landslide monitoring systems are installed across Himachal Pradesh.

"Three systems have recently been deployed in Dharampur along the Kalka - Shimla track with Indian Railways. Several other deployments are in the pipeline, which include several districts in HP, Maharashtra and Kerala," Dutt said.

According to statistics shared by the Home Ministry in Parliament, nearly 6,800 people lost their lives in the country over the past three years due to hydro meteorological calamities such as flash floods, landslides and cyclones and West Bengal has recorded the highest deaths among all states.

"Improved weather forecasting has definitely increased India's capacity to deal with cyclones. When fishermen are warned against going to the sea in advance, people along the coast are shifted to safer locations and emergency teams are on alert to deal with any eventuality. Such a system is

lacking for landslides even though rainfall is the most common trigger that brings down the already destabilised slopes," said a road safety expert.

Among the ongoing experiments for early detection of landslides is by Coimbatore-based Amrita Vishwa Vidyapeetham, which has set up real-time landslide monitoring and early warning systems in Munnar (Kerala) and Gangtok (Sikkim). The multiple sensor-based system analyses rainfall infiltration, pore water pressure (pressure of groundwater held within soil), vibrations, movements, and slope instability.

According to an analysis of 45,334 landslides by the National Remote Sensing Centre, ISRO, Rudraprayag (Uttarakhand), Tehri Garhwal (Uttarakhand), Rajouri (Jammu and Kashmir), Thrissur (Kerala) and Pulwama (Jammu and Kashmir) are the top five hill districts most vulnerable to the damage.

These places not only have a large landslide-prone area, but also a high number of people, livestock, houses and roads exposed to these disasters. Among the states, Uttarakhand was found to be the most vulnerable owing to major pilgrimage routes.

Researchers at the Rajiv Gandhi Institute of Technology, Mumbai believe an early warning system can be used to minimize the impact imposed by landslide on human, damage to property and loss of live.

"The ability to monitor slope movements in timely fashion will inform the people of possible slope failures – giving them adequate lead time to relocate to a safer place as well as stop vehicular movement in the area. Landslide monitoring is based on geotechnical instrumentations using, for examples ultrasonic sensors, water level sensors, vibration sensors, accelerometer, inclinometer and rainfall sensor," said the lead researcher of a "Smart Road Safety and Landslide Detection System".

"However, cable based monitoring systems are costly, require continuous maintenance, and are limited in their communication flexibility. To overcome these limitations, wireless sensor networks and Internet of things are a viable alternative technology.

"State-of the-art wireless landslide monitoring systems collect environmental data from the slope and transfer it to connected computer systems for persistent storage. It monitors and detects the landslide and alert people from landslide hazards through android app," he added.

https://economictimes.indiatimes.com/news/india/indian-researchers-working-on-early-landslide-detection-systems-to-reduce-fatalities-damage/articleshow/87236375.cms

BusinessMirror

Mon, 25 Oct 2021

Despite pandemic delay, AFP pursues arms systems upgrade

By Rene Acosta

The Army is continuing to scout for the best weapons and arms for its forces in its ongoing capability upgrade program, one of which is by sending contingents to international defense and arms shows around the world.

Army spokesman Col. Xerxes Trinidad said an Army contingent led by Army chief of staff Major Gen. Roberto Capulong just came from the Seoul International Aerospace and Defense Exhibition (Seoul ADEX) 2021 held from October 17-21, 2021.

The Seoul ADEX, held at an airbase in Seoul, South Korea, is a biennial activity featuring defense events, including displays of cutting-edge technology weapons systems and equipment, academic symposiums and other defense-related activities.

Trinidad said the activity provided Capulong and his team with relevant and valuable opportunities for networking and access to the latest capabilities across the ground, naval, and aerospace domains.

Army chief Lt. Gen. Andres Centino emphasized the importance of the Army's presence in the defense exposition at a time when the unit is building up its capabilities by acquiring modern arms and weapons.

"Our contingent to the ADEX in Seoul, South Korea [was meant] to get valuable information about the new technologies in defense hardware and equipment that will be useful in planning the procurement of military hardware for the Philippine Army," underscored Lt. Gen. Centino.

"The Philippine 2Army is geared towards the modernization and development of its capabilities. This endeavor strengthens our defense posture and enables us in dealing with the fast-evolving nature of security threats in our country and region," he said.

The Army has been eyed to take possession of the first land-based missile battery for the country, courtesy of the Indian-made Brahmos missile, although its acquisition had been delayed by the Covid-19 pandemic.

Recently, the Philippine Navy took delivery of its European-made Mistral 3 missiles for its two brand-new frigates.

https://businessmirror.com.ph/2021/10/25/despite-pandemic-delay-afp-pursues-arms-systems-upgrade/

Mediarun Search

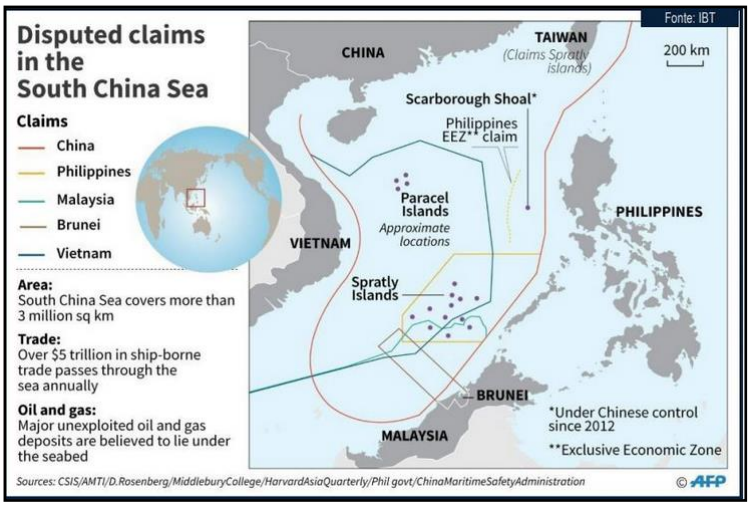
Sun, 24 Oct 2021

AUKUS and strategic development of the Philippines – Air and Naval Defense

By Gabriela Veloso and Tina Fernandez

The recent formalization of the Australia-US-UK Strategic Agreement to build nuclear-powered submarines in Australia has sparked discussions, particularly regarding security issues in the Indo-Pacific. The leaders of the countries affirmed the intentions of the partnership to ensure peace and cooperation in the face of the growing disputes over the maritime lands in the region.

In addition to Australia, the agreement could generate advantages and benefits for Asian countries. In this sense, what are the effects of AUKUS in the Philippines?



One of Manila's major international alliances is the Mutual Defense Treaty with the United States, ratified in 1951, which was intended to contain Soviet advances in Asia. Until the 1990s, the Philippines was home to two of the largest US military bases. Moreover, the two countries concluded the Visiting Forces Agreement, which facilitated the presence of American aircraft, ships, and military personnel on the Philippine territory.

However, the elections of Donald Trump and Rodrigo Duterte have opened the way for China to approach the Philippines more forcefully, where former allies have been drifting apart. At the time, with the goal of reducing the country's high unemployment rates, Duterte saw opportunities for economic development in the Belt and Road Initiative.

However, Beijing's conquest of countries' exclusive economic zones in the South China Sea is inconvenient but not directly counteracted, especially by China's military superiority. Thus, in 2018, Duterte approved the second phase of the Armed Forces Modernization Plan, to be completed by 2028. At this stage, initially planned at a cost of 5.6 billion US dollars, there will be the acquisition of military means. So far, the Philippines has acquired two guided missile frigates from South Korea, and contracted eight fast-class patrol ships. chaldagAnd remote-controlled weapons stations and Israeli missiles.

There is also a contract with India, which includes the acquisition of supersonic cruise missiles Brahmos and the negotiation of 6 maritime patrol ships with Australia.

For the Philippines, AUKUS comes at an opportune time, as the third phase of its modernization program

The armed forces envisage acquiring six conventional submarines, so the development of the Australian submarine program could push the Filipinos and possibly turn them into nuclear-powered ships. Thus, the agreement encourages the search for new partnerships, brings the Philippines closer to other countries and contributes to a more assertive stance toward China.

Source: GeoCurrent Bulletin

https://www.mediarunsearch.co.uk/aukus-and-strategic-development-of-the-philippines-air-and-naval-defense/

THE HINDU BusinessLine

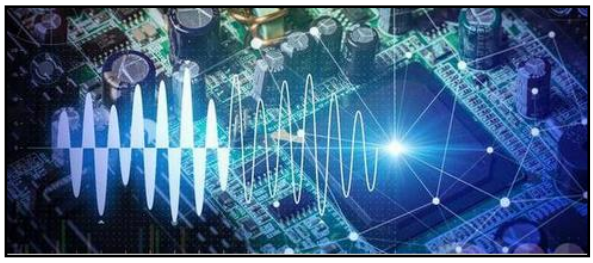
Sun, 24 Oct 2021

Era of energy harvesters

The science of generating electricity from every little motion on earth

By M Ramesh

Nothing in this world (except, perhaps, Wordsworth's butterfly) is really motionless. Everything is, if not moving, at least shaking, or vibrating. Ocean waves, vehicles zipping along and branches swaying in the wind are more visible, but even bridges shiver as vehicles pass over them and buildings are built to move a little, to let a gust blow or absorb an earthquake wave.



IoT rollout would depend on finding ways to self-power sensors - ISTOCK.COM

Every motion is an opportunity to capture energy, even if only a bit. This thinking has given rise to more research into an area that broadly goes by the name of 'energy harvesting'.

In today's world of IoT or internet of things, where every device is connected to others wirelessly, there is a need to provide local power. There are (going to be) billions of sensors everywhere. Thousands may lie, for example, under the soil in an agricultural field. Inside aircraft engines there are dozens of sensors that send information about the health of a component. Underwater sensors detect enemy submarines.

All these need energy. Imagine powering billions of sensors with batteries that need to be replaced every few years. Nightmare! The only way then is self-powering sensors.

Harvesting energy from movements is thought of as the solution.

Interesting products are being conceived of. For example, shoes that generate electricity as you walk. The Defence Research and Development Organisation is working on a device that a soldier can carry in a backpack to generate power as he or she walks.

At IIT Madras, Shaik Faruque Ali, Associate Professor, Department of Applied Mechanics, is working on a project, funded by the Department of Science and Technology, to produce 'energy harvesting trees' — their leaves generate electricity as they tremble in the wind. He is also working on a project to make wearable devices that produce electricity from the wearer's movements.

How is electricity generated from movements? There is the good old electro-magnetic way — how most electricity is produced today, by moving a coil within a magnetic field. The more the smagnetic lines the coil cuts, the more the electricity passing through the coil.

So, if you place a coil hanging like a pendulum within a magnetic field in your car, you have yourself an onboard generator.

The other way of harvesting movements (or vibration) is to use the 'piezoelectric effect'. Piezoelectric materials spew out electric charge when squeezed (subjected to mechanical stress). This is a reversible property, meaning that if electricity is passed through a piezoelectric material, it will vibrate.

Hybrid devices

Yet another trick is to combine both electromagnetic and piezoelectric principles to produce hybrid devices. Electromagnetic devices work under low frequencies of movement, while the piezo work only at high frequencies. IIT Madras has developed and placed such materials on the buses that ply within the campus, as an experiment.

Ali says that India is not lagging other countries in the theoretical research in this area, but it seemingly lags in its application, as only some sensor companies have dipped into this technology.

EnOcean GmbH of Germany, for instance, proclaims: "We obtain energy for our wireless sensors from the immediate surroundings — from motion, light and temperature." UK-based

Perpetuum (recently acquired by Japan's Hitachi Rail) specialises in railway bogie monitoring using sensors that power up through the vibrations of the bogies.

Well, if the science is so well-known, what has kept 'energy harvesters' from becoming ubiquitous already? Ali points out that there are still some issues to be resolved (they will be). One issue, for example, is that the devices generate very small (micro to milli watts) power. To generate more, Ali says, you can harvest energy from multiple sources and connect them to form an array.

Which brings the discussion to the next challenge. Today, devices can be made for a particular application, which then will work under that specific movement. But harvesting more energy calls for devices that can tap into multiple types of movements — the devices need to be imparted with more versatility. This is currently an area of research.

The economic value of the harvested power may not be much. But energy harvesters are what would make IoT rollout possible.

The future is in movement.

https://www.thehindubusinessline.com/business-tech/era-of-energy-harvesters/article37151389.ece

DRDO on Twitter

A. Bharat Bhushan Babu
@SpokespersonMoD

High-Speed Expendable Aerial Target #ABHYAS successfully flight-tested by @DRDO_India. The vehicle can be used as an aerial target for evaluation of various missile systems.
Press Release 👇
pib.gov.in/PressReleasePa...

@DefenceMinIndia
@AjaybhattBJP4UK
@drajaykumar_ias @PIB_India

6:00 अपराह्न · 22 अक्तू॰ 2021

Rajnath Singh @rajnathsingh · Oct 22

Had an amazing experience of flying in LCA Tejas Simulator at the Aeronautical Development Establishment (ADE) facility in Bengaluru.


A. Bharat Bhushan Babu
@SpokespersonMoD
Raksha Mantri Shri @rajnathsingh visits the Aeronautical Development Establishment (ADE) facility in Bengaluru.
@DefenceMinIndia @AjaybhattBJP4UK @drajaykumar_ias @PIB_India
1:01 PM · Oct 22, 2021


ANI
@ANI
#WATCH Indian Army displays Pinaka & Smerch multiple rocket launcher systems in Assam
ANI
11:33 AM · Oct 22, 2021

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Defence News

Defence Strategic: National/International

Press Information Bureau
Government of India

Ministry of Defence

Sun, 24 Oct 2021 12:46PM

2nd Army Commanders' Conference of 2021 scheduled from 25 to 28 October 2021 at New Delhi

The 2nd Army Commanders' Conference of 2021 is scheduled from 25 to 28 October 2021 at New Delhi. Army Commanders' Conference is an apex level biannual event which is held in April and October every year. The conference is an institutional platform for conceptual level deliberations, culminating in making important policy decisions for the Indian Army. The conference is also a formal forum for the senior leadership of the Indian Army to interact with the senior officials of the Department of Military Affairs and Department of Defence.

The apex leadership of Indian Army will brainstorm on current / emerging security and administrative aspects to chart the future course for the Indian Army, in the backdrop of the situation along the borders and challenges imposed by COVID-19 pandemic.

During the conference, the Raksha Mantri Shri Rajnath Singh will address and interact with the Army Commanders. The Chief of Defence Staff and the Chiefs of the Indian Navy and the Indian Air Force are also scheduled to address the senior leadership of Indian Army on avenues for promoting tri-service synergy.

https://pib.gov.in/PressReleasePage.aspx?PRID=1766098

पत्र सूचना कार्यालय
भारत सरकार
रक्षा मंत्रालय

Sun, 24 Oct 2021 12:46PM

दूसरे सेना कमांडर सम्मेलन 2021 का आयोजन 25-28 अक्टूबर, 2021 तक नई दिल्ली में होगा

सेना कमांडरों के दूसरे सम्मेलन का आयोजन 25-28 अक्टूबर, 2021 तक नई दिल्ली में किया जाएगा है। हर वर्ष अप्रैल और अक्टूबर माह में आयोजित होने वाला सेना कमांडरों का सम्मेलन एक शीर्ष स्तरीय द्विवार्षिक कार्यक्रम है। सम्मेलन वैचारिक स्तर पर विचार-विमर्श के लिए एक संस्थागत मंच है, जिसके माध्यम से भारतीय सेना महत्वपूर्ण नीतिगत निर्णयों पर विचार-विमर्श करती है। यह सम्मेलन सैन्य मामले विभाग और रक्षा विभाग के वरिष्ठ अधिकारियों के साथ वार्तालाप के लिए भारतीय सेना के वरिष्ठ नेतृत्व का एक औपचारिक मंच भी है।

इस सम्मेलन के दौरान भारतीय सेना के शीर्ष नेतृत्व द्वारा वर्तमान/उभरती सुरक्षा और प्रशासनिक पहलुओं पर मंथन किया जाएगा, ताकि सीमाओं पर स्थिति और कोविड-19 महामारी से उत्पन्न हुई चुनौतियों की पृष्ठभूमि में भारतीय सेना के लिए भविष्य की रूपरेखा तैयार की जा सके।

सम्मेलन के दौरान, रक्षा मंत्री श्री राजनाथ सिंह सेना कमांडरों को संबोधित करेंगे और उनके साथ संवाद करेंगे। चीफ ऑफ डिफेंस स्टाफ, भारतीय नौसेना और भारतीय वायु सेना के प्रमुख भी इस सम्मेलन के दौरान तीनों सेनाओं के बीच तालमेल को बढ़ावा देने के लिए भारतीय सेना के वरिष्ठ नेतृत्व से जुड़े विषयों पर विचार-विमर्श करेंगे।

https://pib.gov.in/PressReleasePage.aspx?PRID=1766111

Press Information Bureau
Government of India

Ministry of Defence

Sun, 24 Oct 2021 10:14AM

Indian Navy's first training squadron (1ts) visit to Sri Lanka

The 1st Training Squadron (comprising Indian Naval Ships Sujata, Magar, Shardul, Sudarshini, Tarangini and Coast Guard Ship Vikram) is on a four day visit to Sri Lanka from 24 - 28 Oct 21 as part of their Overseas Deployment for the 100th and 101st Integrated Officers Training Course. The deployment is aimed to broaden the horizons of young officers and officer-trainees by exposing them to the socio-political and maritime facets of different countries in the Indian Ocean Region. The deployment will also expose the trainees onboard towards the conduct of *IN* warships in various evolutions at sea, port familiarisation and above all, foster the bridges of friendship with foreign nations.

The ships are the part of Southern Naval Command (SNC), which is the Training Command of the Indian Navy and is headed by Vice Admiral AK Chawla, Flag Officer Commanding-in-Chief, Southern Naval Command (SNC). The Indian Navy has been imparting training to international trainees for more than four decades now. As on date, a large number of officers and sailors from Sri Lanka are undergoing various ab-initio to advanced courses at SNC. The Command has gained the reputation of being the finest training destination by maintaining focussed approach to provide high quality training and by constant adaptation to evolving tactics and technologies.

The 1st Training Squadron based at Kochi provides the 'first sea legs' to the Executive Officers of the Indian Navy on completion of their ab-initio training at the Indian Naval Academy. The Squadron comprises seven indigenously built ships, namely, Indian Naval Ships Tir, Sujata, Magar, Shardul, Coast Guard Ship Vikram and two Sail Training Ships INS Sudarshini and INS Tarangini. The Squadron is currently helmed by Captain Aftab Ahmed Khan, Senior Officer First Training Squadron who also dons the dual hat of Commanding Officer, INS Tir.

During the four day long deployment *IN* ships Magar and Shardul alongwith trainees of 101 IOTC will visit the Colombo harbour, while *IN* ships Sujata, Sudarshini, Tarangini and CGS Vikram will visit Trincomalee with the trainees of 100th IOTC. Various training activities are planned to be conducted between the Navies of the two countries with the aim to enhance the inter operability of the two forces.

The period of Overseas Deployment would help in developing the skills of seamanship and ship handling and nurture a spirit of adventure among the young officers. It will, not only develop the ability to meet challenges with verve and vigour, but also inculcate a deep understanding of, and respect for, the elements within the maritime environment. The entire crew of all the visiting ships are doubly vaccinated and have also been tested for COVID-19.

https://pib.gov.in/PressReleasePage.aspx?PRID=1766058

पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Sun, 24 Oct 2021 10:14AM

भारतीय नौसेना की पहली प्रशिक्षण स्क्वाड्रन (1टीएस) की श्रीलंका यात्रा

भारतीय सेना की पहली प्रशिक्षण स्क्वाड्रन (जिसमें भारतीय नौसेना के जहाज सुजाता, मगर, शार्दुल, सुदर्शनी, तरंगिनी और तटरक्षक जहाज विक्रम शामिल हैं) दिनांक 24 से 28 अक्टूबर 2021 तक चार दिन के लिए 100वें और 101वें एकीकृत अधिकारी प्रशिक्षण पाठ्यक्रम के लिए श्रीलंका की यात्रा पर हैं। तैनाती का उद्देश्य युवा अधिकारियों और अधिकारी-प्रशिक्षुओं को हिंद महासागर क्षेत्र में विभिन्न देशों के सामाजिक-राजनीतिक और समुद्री पहलुओं से अवगत कराकर उनके दृष्टिकोण को व्यापक बनाना है। यह तैनाती प्रशिक्षुओं को समुद्र में विभिन्न तैनातियों में भारतीय नौसेना के युद्धपोतों के संचालन, बंदरगाह से परिचित कराने और सबसे बढ़कर, विदेशी राष्ट्रों के साथ दोस्ताना सम्बंधों को बढ़ावा देने के बारे में भी बताएगी।

यह जहाज दक्षिणी नौसेना कमान (एसएनसी) का हिस्सा हैं, जो भारतीय नौसेना का प्रशिक्षण कमान है और इसका नेतृत्व दक्षिणी नौसेना कमान (एसएनसी) के फ्लैग ऑफिसर कमांडिंग-इन-चीफ वाइस एडमिरल एके चावला कर रहे हैं। भारतीय नौसेना पिछले चार दशकों से अधिक समय से अंतरराष्ट्रीय प्रशिक्षुओं को प्रशिक्षण दे रही है। आज की तारीख में, श्रीलंका से बड़ी संख्या में अधिकारी और नाविक एसएनसी में विभिन्न शुरुआती से लेकर उन्नत पाठ्यक्रमों में प्रवेश ले रहे हैं। कमान ने उच्च गुणवत्ता वाले प्रशिक्षण प्रदान करने के लिए केंद्रित दृष्टिकोण बनाए रखते हुए और विकसित रणनीति और प्रौद्योगिकियों के निरंतर अनुकूलन द्वारा प्रशिक्षण का एक बेहतरीन गंतव्य होने की प्रतिष्ठा प्राप्त की है ।

कोच्चि स्थित पहला प्रशिक्षण स्क्वाड्रन भारतीय नौसेना अकादमी में अपने प्रारंभिक प्रशिक्षण के पूरा होने पर भारतीय नौसेना के कार्यकारी अधिकारियों को 'फर्स्ट सी लेग्स' प्रदान करता है। स्क्वाड्रन में स्वदेशी रूप से निर्मित सात जहाज शामिल हैं, अर्थात् भारतीय नौसेना के जहाज तीर, सुजाता, मगर, शार्दुल, तटरक्षक जहाज विक्रम और दो सेल ट्रेनिंग जहाज आईएनएस सुदर्शनी और आईएनएस तरंगिनी। स्क्वाड्रन वर्तमान में कैप्टन आफताब अहमद खान, सीनियर ऑफिसर फर्स्ट ट्रेनिंग स्क्वाड्रन की देखरेख में है, जो कमांडिंग ऑफिसर, आईएनएस तीर के कमांडिंग अधिकारी भी हैं।

चार दिवसीय तैनाती के दौरान भारतीय नौसेना के जहाज मगर और शार्दुल 101 आईओटीसी के प्रशिक्षुओं के साथ कोलंबो बंदरगाह का दौरा करेंगे, जबकि आईएन जहाज सुजाता, सुदर्शनी, तरंगिनी और सीजीएस विक्रम 100वें आईओटीसी के प्रशिक्षुओं के साथ त्रिंकोमाली जाएंगे। दोनों देशों की नौसेनाओं के बीच विभिन्न प्रशिक्षण गतिविधियों का आयोजन करने की योजना है, जिसका उद्देश्य दोनों सेनाओं की अंतर-संचालन क्षमता को बढ़ाना है।

ओवरसीज डिप्लॉयमेंट की अवधि से युवा अधिकारियों में सीमैनशिप और शिप हैंडलिंग के कौशल को विकसित करने और रोमांच की भावना का पोषण करने में मदद मिलेगी। यह न केवल साहस और जोश के साथ चुनौतियों का सामना करने की क्षमता विकसित करेगा, बल्कि समुद्री वातावरण के तत्वों की गहरी समझ और उनके प्रति सम्मान भी पैदा करेगा। सभी आने वाले जहाजों के पूरे दल का दोहरा टीकाकरण किया गया है और उनका कोविड-19 के लिए परीक्षण भी किया गया है।

https://pib.gov.in/PressReleasePage.aspx?PRID=1766161

Press Information Bureau
Government of India

Ministry of Defence

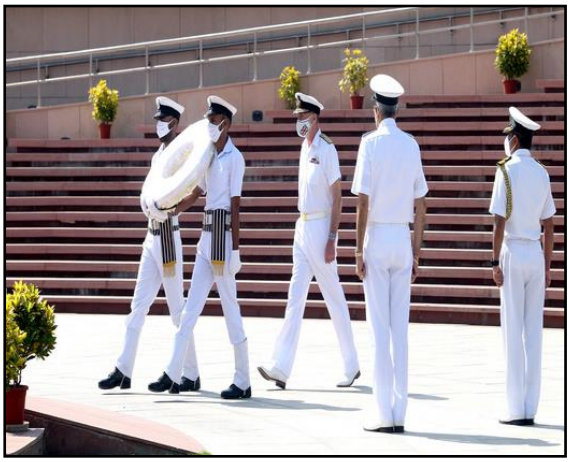
Fri, 22 Oct 2021 2:58PM

Admiral Sir Tony Radakin, First Sea Lord and Chief of Naval Staff, Royal Navy Visit to India

Admiral Sir Tony Radakin, First Sea Lord and Chief of Naval Staff, Royal Navy is on a three day official visit to India from 22-24 Oct 21. Adm Radakin interacted with Adm Karambir Singh, Chief of the Naval Staff on 22 Oct 21. Amongst other naval bilateral cooperation issues, the Chiefs emphasised on collaborative mechanisms towards ensuring peace and security in the region. He is also scheduled to visit Indian Navy's Western Naval Command (at Mumbai) wherein he would interact with VAdm R Hari Kumar, Flag Officer Commanding-in-Chief, Western Naval Command. Adm Radakin would also embark HMS Queen Elizabeth, Flagship of UK CSG 21.

Sharing a modern partnership bound by strong ties, the bilateral relationship between India and UK was upgraded to a 'Strategic Partnership' in 2004 and further strengthened through reciprocal visits by the Prime Ministers. Subsequently, during the Virtual Summit between the Prime Ministers of both the countries on 04 May 21, 'Roadmap 2030' was adopted towards elevating the bilateral ties to a 'Comprehensive Strategic Partnership'.

The Indian Navy cooperates with the Royal Navy on numerous issues, which include operational interactions such as the KONKAN and Maritime Partnership Exercise, training exchanges, exchange of White Shipping Information and Subject Matter Experts in various fields, all of which are coordinated through the medium of Executive Steering Group (ESG) meetings conducted annually. In addition, warships from both Navies regularly make port calls at each other's ports.



https://pib.gov.in/PressReleasePage.aspx?PRID=1765717

NDTV

Sun, 24 Oct 2021

China's ambitions danger to stability in South Asia, Says General Bipin Rawat

China's foray into Myanmar and Bangladesh are attempts to "engulf India", Chief Of Defence Staff Bipin Rawat said

Guwahati: Chief of Defence Staff General Bipin Rawat today said that China's ambitions and aspirations to global power presented an "omnipresent danger" to stability in South Asia.

China is making "huge" inroads in South Asia and in the Indian Ocean region to strengthen its position as an emerging global power, he said, while delivering the first Ravi Kant Singh Memorial Lecture here.

General Bipin Rawat was delivering the first Ravi Kant Singh Memorial Lecture. File

"Of late, we are witnessing a geo-strategic competition and huge investment by China in the region to create a favourable posture to provide sufficient security to its interests," he said.

Bangladesh and Myanmar have been the largest recipients of Chinese military aid in the recent past, along with significant investments in Nepal, Sri Lanka and Maldives "to gain strategic foothold (in the region)", he said.

He added that China's foray into Myanmar and Bangladesh are not in India's national interest as these are attempts to "engulf India".

"There exists an omnipresent danger of regional strategic instability," Mr Rawat said, adding that it has the potential of "threatening India's territorial integrity and strategic importance".

The General also said Pakistan's state-sponsored terrorism as well as by non-state actors against India is a stumbling block to peace process between the two countries.

He described the "partnership" between Pakistan and China on a range of issues, from China providing military hardware to Pakistan and supporting it in international fora, as an "anti-India nexus". Later, addressing a press conference, the Chief of Defence Staff said border issues with China have to be viewed in their totality and not as issues pertaining to the Ladakh sector or Northeastern states.

"In 2020, there was a little bit of problem (between India and China). Issues are being resolved with talks at different levels, from military to political level," he said.

Mr Rawat also said such issues have cropped up in the past too between the two neighbours but have been resolved.

"There are suspicions between the two countries, and hence, it takes time to resolve the issues. The people must have faith and confidence in the system and the armed forces," he added.

He said as a measure to counter China's influence in the region, India has to step up its engagement in neighbouring countries. He said, "Chinese have a habit of using money power to gain popularity in a country. But as our Prime Minister has given a clarion call, we believe in security and growth for all."

"We have to tell our neighbours that we are here as permanent friends and engage with them on equal terms and we consider all neighbours as equal partners in development," he added.

Mr Rawat also emphasised on the need to exploit cultural linkages with neighbouring countries to strengthen ties.

On the country's defence preparedness, Mr Rawat said, "We are standing strong."

He said there is adequate defence and arms systems at India's disposal, and the government has allowed the armed forces to procure needed armaments by invoking emergency powers.

"No questions are being asked (by the government) as long as our security mechanism improves," he added.

Commenting on the recent violence against security forces as well as civilians in Jammu and Kashmir, Mr Rawat said, "Our western adversary is indulging in a proxy war with us. They will do anything to disturb peace in Jammu and Kashmir."

He also said the killings in Jammu & Kashmir were an attempt by the neighbouring country to spread fear among the people. "We should not fear them or fall prey to such traps," he said, adding that any possible exodus of people from J&K should be stopped.

To counter Pakistan's designs, the Chief of Defence Staff said the intelligence network is being strengthened. Mr Rawat added that the freedom of movement that people in Jammu & Kashmir were starting to enjoy in recent times may be disrupted due to the current situation and urged for people's cooperation in tackling the situation.

https://www.ndtv.com/india-news/chinas-ambitions-danger-to-stability-in-south-asia-says-general-bipin-rawatat-2585706

R.भारत

Sat, 23 Oct 2021

साइबर और अंतरिक्ष क्षेत्र में चीन की तकनीकी प्रगति सर्वाधिक चिंताजनक है: जनरल बिपिन रावत

प्रमुख रक्षा अध्यक्ष (सीडीएस) जनरल बिपिन रावत ने शुक्रवार को कहा कि भारत कई बाहरी सुरक्षा चुनौतियों का सामना कर रहा है।

प्रमुख रक्षा अध्यक्ष (सीडीएस) जनरल बिपिन रावत ने शुक्रवार को कहा कि भारत कई बाहरी सुरक्षा चुनौतियों का सामना कर रहा है और सबसे ज्यादा चिंताजनक साइबर तथा अंतरिक्ष क्षेत्र में चीन की तकनीकी प्रगति है।

वह भारतीय वायुसेना के तीन दिवसीय सम्मेलन को संबोधित कर रहे थे, जिसका उद्घाटन 1971 के भारत-पाक युद्ध में जीत के 50 साल पूरे होने पर मनाए जा रहे 'स्वर्णिम विजय वर्ष' के उपलक्ष्य में यहां रक्षा मंत्री राजनाथ सिंह ने येलहंका वायुसेना स्टेशन में किया था।

रावत ने कहा, "भारत को कई बाहरी सुरक्षा चुनौतियों का सामना करना पड़ रहा है, जिनमें गहरे क्षेत्रीय अंतर्संबंध, अनसुलझे सीमा विवादों की विरासत, प्रतिस्पर्धा की संस्कृति और भारत के रणनीतिक स्थान को कमतर करने संबंधी चुनौती शामिल है।"

उन्होंने कहा कि भारत हिंद-प्रशांत क्षेत्र में भू-रणनीतिक प्रतिस्पर्धा भी देख रहा है, जिसमें हिंद महासागर क्षेत्र में रणनीतिक ठिकानों की दौड़ और उत्तरी शत्रु चीन द्वारा क्षेत्र में 'बेल्ट एंड रोड' चौकियों का सैन्यीकरण बढ़ाना शामिल है।

रावत ने कहा, "साइबर और अंतरिक्ष क्षेत्र में चीन की तकनीकी प्रगति सबसे ज्यादा चिंताजनक है।" उन्होंने कहा कि उत्तरी सीमाओं पर हुईं आक्रामक मुद्रा की हालिया घटनाएं चीन की विस्तारवादी विदेश नीति का केंद्र बनी रहेंगी, जिसके बारे में भारत को हमेशा सावधान रहना होगा।

पाकिस्तान के मुद्दे पर सीडीएस ने कहा कि सीमा पार आतंकवाद को लगातार प्रायोजित करना, सोशल मीडिया पर भारत विरोधी बयानबाजी और भारत के भीतर सामाजिक वैमनस्य पैदा करने के प्रयास, भारत और उस देश के बीच विश्वास की खाई को "न भरने वाले" प्रतीत होते हैं।

इस अवसर पर वायुसेना प्रमुख एयर चीफ मार्शल वी आर चौधरी, रक्षा सचिव अजय कुमार और कर्नाटक के राजस्व मंत्री आर अशोक सहित अन्य लोग उपस्थित थे।

इस बात की ओर इशारा करते हुए कि 1971 के बाद से दुनिया में चीजें कैसे बदली हैं, अजय कुमार ने आज के सुरक्षा परिदृश्य का सामना करने के लिए "कई गुना अधिक" तैयार होने की आवश्यकता पर बल दिया।

https://bharat.republicworld.com/india-news/general-news/chinas-technological-progress-in-cyber-and-space-sector-is-most-worrying-general-bipin-rawat

THE HINDU

Mon, 25 Oct 2021

Process of sanctioning new China border battalions for ITBP in final stage: Nityanand Rai

The proposal for sanctioning new ITBP battalions and a sector headquarter in the northeast has been under the consideration of the Home Ministry for over two years now

Greater Noida: The process to authorise new battalions for the Indo-Tiberan Border Police (ITBP), guarding the Line of Actual Control (LAC) between India and China, is in the last stage and the government is determined to provide transport and logistical support to all security forces, Union Minister Nityanand Rai said on Sunday.

Addressing the 60th Raising Day event of the mountain-warfare-trained ITBP, Mr. Rai said the government had last year sanctioned 47 new border posts and a dozen staging camps (operational bases for troops undertaking border patrol) to the force.

"Deliberations for providing new manpower and battalions for the ITBP are in the last stages," Mr. Rai, the Minister of State for Home Affairs, said.

Officials said the force is expected to get a sanction of seven new battalions comprising about 8,000 personnel for its new border posts that will mainly come up in the Arunachal Pradesh sector of the LAC on India's eastern flank.

Union Minister of State for Home Nityanand Rai lauded the ITBP for their bravery and for giving a "befitting reply" to their opponents during the clashes between Indian and Chinese forces in Ladakh during May-June last year. | Photo Credit: A.M. Faruqu

The proposal for sanctioning new ITBP battalions and a sector headquarter in the northeast has been under the consideration of the Home Ministry for over two years now. But with the last year's sanction of the new border outposts and staging camps, the proposal is expected to get approval soon, they said.

An ITBP battalion has a strength of just over 1,000 personnel.

At the rising day event, Mr. Rai lauded the ITBP for their bravery and for giving a "befitting reply" to their opponents during the clashes between Indian and Chinese forces in Ladakh during May-June last year.

He also decorated 20 ITBP officers and personnel as he pinned police medals for gallantry on their uniform for displaying bravery and courage during the clashes. These medals were announced by the Centre on Independence Day eve.

The Minister said the 'Operation Snow Leopard' conducted by the ITBP in Himalayan ranges gave a "big message that India will never compromise on its sovereignty and security." The force proved it was "second to none" when it came to guarding the country, Mr. Rai said, adding, "It is a matter of pride that the ITBP won these many bravery medals in one instance for the first time in its history." Mr. Rai said the county's security forces have got "independence to operate and decide" under the leadership of Prime Minister Narendra Modi.

The minister said the Modi government was working to plug all gaps along India's international borders and trying to enhance the capabilities of the security forces and also equip them with better weapons and technology.

ITBP Director General Sanjay Arora also praised his troops for their gallant action during the clashes with the Chinese People's Liberation Army last year in the Ladakh area.

He recounted the initiatives taken by the force to combat the coronavirus pandemic in the country by operating health facilities in the national capital region.

Union Home Minister Amit Shah, who is in Jammu and Kashmir, greeted the personnel and their families through a Twitter message.

"ITBP is well known for protecting the motherland in the toughest of terrains and serving the nation during natural calamities. India is proud of ITBP's valour and determination," he said.

The about 90,000-personnel strong ITBP was raised on this day in 1962 in the aftermath of the Chinese aggression.

https://www.thehindu.com/news/national/process-of-sanctioning-new-china-border-battalions-for-itbp-in-final-stage-nityanand-rai/article37149173.ece

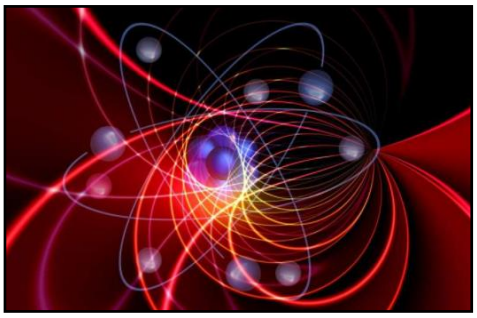
Science & Technology News

PHYS.ORG

Sat, 23 Oct 2021

Quantum battles in attoscience: Following three debates

In July 2020, 300 researchers from 34 different countries attended the CECAM virtual workshop, 'Quantum Battles in Attoscience'. EPJ D presents three community papers which emerged from the in-depth panel discussions held at this occasion.



Credit: CC0 Public Domain

The field of attoscience has been kickstarted by new advances in laser technology. Research began with studies of three particular processes. Firstly, 'above-threshold ionization' (ATI), describing atoms which are ionized by more than the required number of photons. Secondly, 'high harmonic generation' (HHG) occurs when a target is illuminated by an intense laser pulse, causing it to emit high-frequency harmonics as a nonlinear response. Finally, 'laser-induced nonsequential double ionization' (NSDI) occurs when the laser field induces correlated dynamics within systems of multiple electrons.

Using powerful, ultrashort laser pulses, researchers can now study how these processes unfold on timescales of just 10-18 seconds. This gives opportunities to study phenomena such as the motions of electrons within atoms, the dynamics of charges within molecules, and oscillations of electric fields within laser pulses.

Today, many theoretical approaches are used to study attosecond physics. Within this landscape, two broadly opposing viewpoints have emerged: the 'analytical' approach, in which systems are studied using suitable approximations of physical processes; and the 'ab-initio' approach, where systems are broken down into their elemental parts, then analyzed using fundamental physics.

Using ATI, HHG, and NSDI as case studies, the first of the Quantum Battles papers explores this tension through a dialog between two hypothetical theorists, each representing viewpoints expressed by the workshop's discussion panel. The study investigates three main questions: relating to the scope and nature of both approaches, their relative advantages and disadvantages, and their complementary roles in scientific discovery so far.

Another source of tension within the attoscience community relates to quantum tunneling—describing how quantum particles can travel directly through energy barriers. Here, a long-standing

debate exists over whether tunneling occurs instantaneously, or if it requires some time; and if so, how much.

The second paper follows this debate through analysis of the panel's viewpoints, as they discussed the physical observables of tunneling experiments; theoretical approaches to assessing tunneling time; and the nature of tunneling itself. The study aims to explain why so many approaches reach differing conclusions, given the lack of any universally-agreed definition of tunneling.

The wave-like properties of matter are a further key concept in quantum mechanics. On attosecond timescales, intense laser fields can be used to exploit interference between matter waves of electrons. This allows researchers to create images with sub-atomic resolutions, while maintaining the ability to capture dynamics occurring on ultra-short timescales.

The final 'battle' paper explores several questions which are rarely asked about this technique. In particular, it explores the physical differences between the roles of matter waves in HHG—which can be used to extend imaging capabilities; and ATI—which is used to generate packets of electron matter waves.

The Quantum Battles workshop oversaw a wide variety of lively, highly interactive debates between a diverse range of participants: from leading researchers, to those just starting out in their careers. In many cases, the discussions clarified the points of tension that exist within the attoscience community. This format was seen as particularly innovative by the community and the general public, who could follow the discussions via dedicated social media platforms. One participant even referred to the Quantum Battles as a `breath of fresh air'.

Quantum Battles promoted the view that while initial discoveries may stem from a specific perspective, scientific progress happens when representatives of many different viewpoints collaborate with each other. One immediate outcome is the "AttoFridays" online seminar series, which arose from the success of the workshop. With their fresh and open approach, Quantum Battles and AttoFridays will lead to more efficient and constructive discussions across institutional, scientific, and national borders.

More information: Gregory S. J. Armstrong et al, Dialogue on analytical and ab initio methods in attoscience, *The European Physical Journal D* (2021). DOI: 10.1140/epjd/s10053-021-00207-3

Cornelia Hofmann et al, Quantum battles in attoscience: tunnelling, *The European Physical Journal D* (2021). DOI: 10.1140/epjd/s10053-021-00224-2

Kasra Amini et al, Quantum interference and imaging using intense laser fields, *The European Physical Journal D* (2021). DOI: 10.1140/epjd/s10053-021-00269-3

Journal information: European Physical Journal D

https://phys.org/news/2021-10-quantum-attoscience-debates.html

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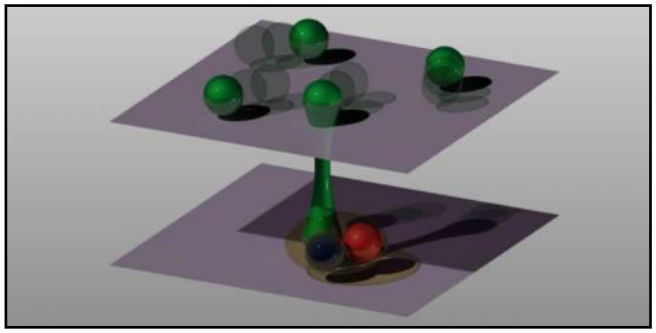
Fri, 22 Oct 2021

Electrical control over designer quantum materials

Exploring the properties and behaviors of strongly interacting quantum particles is one of the frontiers of modern physics. Not only are there major open problems that await solutions, some of them since decades (think high-temperature superconductivity). Equally important, there are various regimes of quantum many-body physics that remain essentially inaccessible with current analytical and numerical tools. For these cases in particular, experimental platforms are sought after in which the interactions between particles can be both controlled and tuned, thus allowing the systematic exploration of wide parameter ranges. One such experimental platform are carefully engineered stacks of two-dimensional (2D) materials. Over the past couple of years, these 'designer quantum materials' have enabled unique studies of correlated electronic states. However, the strength of the interaction between the quantum states is typically fixed once a stack is fabricated. Now the group of Professor Ataç Imamoğlu at the Institute for Quantum Electronics reports a way around this limitation. Writing in *Science*, they introduce a versatile method that enables tuning of the interaction strength in 2D heterostructures by applying electrical fields.



When holes (shown in green) in one layer spatially overlap with excitons (black and red) in the other, then a hole can tunnel and form a Feshbach molecule with the exciton. Credit: Yuya Shimazaki

Strength in a twist

Two-dimensional materials have been in the spotlight of solid-state research ever since the first successful isolation and characterization of graphene—single layers of carbon atoms—in 2004. The field expanded at breath-taking speed ever since, but received a notable boost three years ago, when it was shown that two graphene layers arranged at a small angle relative to one another can host a broad range of intriguing phenomena dominated by electronic interactions.

Such 'twisted bilayer' systems, also known as moiré structures, have been subsequently created with other 2D materials as well, most notably with transition metal dichalcogenides (TMDs). Last year, the Imamoğlu group demonstrated that two single layers of the TMD material molybdenum diselenide ($MoSe_2$), separated by a single-layer barrier made of hexagonal boron nitride (hBN), yield moiré structures in which strongly correlated quantum states emerge. In addition to purely electronic states, these materials also exhibit hybrid light–matter states, which ultimately enables studying these heterostructure by optical spectroscopy—something that is not possible with graphene.

But for all the fascinating many-body physics that these $MoSe_2$/hBN/$MoSe_2$ structures provide access to, they share a drawback with many other solid-state platforms: the key parameters are more or less fixed in fabrication. To change that, the team, led by postdocs Ido Schwartz and Yuya Shimazaki, now adopted a tool that is widely used in experiments on a platform famed for its tunability, ultracold atomic quantum gasses.

Feshbach resonances go electric

Schwartz, Shimazaki and their colleagues demonstrated that they can induce in their system a so-called Feshbach resonance. These allow, in essence, to tune the interaction strength between quantum entities by bringing them into resonance with a bound state. In the case explored by the ETH team, these bounds states are between an exciton (created using the optical transitions in their

system) in one layer and a hole in the other layer. It turns out that when exciton and hole overlap spatially, then the latter can tunnel to the other layer and form an inter-layer exciton–hole 'molecule' (see the figure). Crucially, the relevant inter-layer interaction strength of the exciton–hole interactions, can be readily changed using electric fields.

This electrical tunability of the binding energy of the 'Feshbach molecules' is in contrast to atomic systems, where Feshbach resonances are typically controlled with magnetic fields. Moreover, the experiments by Schwartz, Shimazaki et al. yield the first Feshbach resonances that take place in truly 2D systems, which is of interest in itself. More important, however, might be that the electrically tunable Feshbach resonances explored now in $MoSe_2$/hBN/$MoSe_2$ heterostructures should be a generic feature of bilayer systems with coherent tunneling of electrons or holes. This means that the newly introduced 'tuning knob' might become a versatile tool for a broad range of solid-state platforms based on 2D materials—opening up in turn intriguing perspectives for the wider experimental exploration of quantum many-body systems.

More information: Ido Schwartz et al, Electrically tunable Feshbach resonances in twisted bilayer semiconductors, *Science* (2021). DOI: 10.1126/science.abj3831

Journal information: Science

https://phys.org/news/2021-10-electrical-quantum-materials.html

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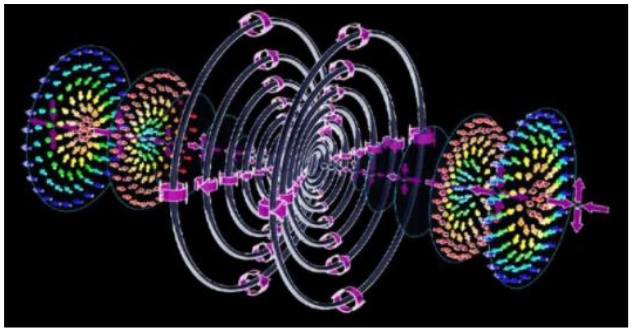
Skyrmions can fly!

Topology in optics and photonics has been a hot topic since 1890 where singularities in electromagnetic fields have been considered. The recent award of the Nobel prize for topology developments in condensed matter physics has led to renewed surge in topology in optics with most recent developments in implementing condensed matter particle-like topological structures in photonics. Recently, topological photonics, especially the topological electromagnetic pulses, hold promise for nontrivial wave-matter interactions and provide additional degrees of freedom for information and energy transfer. However, to date the topology of ultrafast transient electromagnetic pulses had been largely unexplored.



Schematics of spatial topological structures of magnetic vortex rings and skyrmions in a supertoroidal light pulse. The gray dots and rings mark the distribution of singularities (saddle points and vortex rings) in magnetic field, large pink arrows mark selective magnetic vector directions, and the smaller colored arrows show the skyrmionic structures in magnetic field. Credit: Yijie Shen (2021).

In their paper *Nat. Commun.*, physicists in the UK and Singapore report a new family of electromagnetic pulses, the exact solutions of Maxwell's equation with toroidal topology, in which topological complexity can be continuously controlled, namely supertoroidal topology. The electromagnetic fields in such supertoroidal pulses have skyrmionic structures as they propagate in free space with the speed of light.

Skyrmions, sophisticated topological particles originally proposed as a unified model of the nucleon by Tony Skyrme in 1962, behave like nanoscale magnetic vortices with spectacular textures. They have been widely studied in many condensed matter systems, including chiral magnets and liquid crystals, as nontrivial excitations showing great importance for information storing and transferring. If skyrmions can fly, open up infinite possibilities for the next generation of informatics revolution.

"This is the first know examples of propagating skyrmions," says Prof. Nikolay Zheludev, the project supervisor, "the fundamental topological constructs previously observed as spin formations in solids and localized electromagnetic excitations in the nearfield of metamaterial patterns."

The supertoroidal pulse is as a generalization of the so-called "Flying Doughnut," a toroidal single-cycle pulse with space-time non-separable structure with links to vector singularities and non-radiating anapole excitations. The supertoroidal pulse has increasingly complex fractal-like toroidal topological structures, exhibiting electromagnetic field configurations with matryoshka-like singular shells, skyrmionic structures of various skyrmion numbers, and multiple singularities in the Poynting vector field accompanied by multi-layer energy backflow effects. And the topological complexity can be controlled by increasing a supertoroidal order of the pulse increases.

These results put forward supertoroidal pulses as a playground for the study of topological field configurations and their dynamics. The topological features of the supertoroidal pulses presented here provide additional degrees of freedom that could find applications in a number of fields, such as information encoding/decoding schemes involving structured light, optical trapping, manufacturing by light, and particle acceleration. "We believe this is the first time that the skyrmionic structure is proposed in ultrafast structured pulses, and the multiple skyrmionic structure with various textures exist in the instantaneous electromagnetic field of a supertoroidal pulse. Such photonics skyrmionic structures harness intriguing sharp spatial features, promising the potential applications in high-precision metrology and superresolution imaging," says Dr. Yijie Shen, the lead author of the paper.

This work opens many intriguing opportunities for the study of light-matter interaction, ultrafast optics, and topological optics with supertoroidal light pulses (e.g. coupling to electromagnetic anapoles and localized skyrmions) and their applications in superresolution metrology and imaging, information and energy transfer.

More information: Yijie Shen et al, Supertoroidal light pulses as electromagnetic skyrmions propagating in free space, *Nature Communications* (2021). DOI: 10.1038/s41467-021-26037-w

Journal information: Nature Communications

https://phys.org/news/2021-10-skyrmions.html

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Fri, 22 Oct 2021

The optical pairing helping to speed up and secure wireless communications

By Ben Paul

Han and Leia. George and Amal. Kermit and Miss Piggy. Gomez and Morticia. History's greatest couples rely on communication to make them so strong their power cannot be denied.

But that's not just true for people (or Muppets), it's also true for lasers.

The researchers' breakthrough could help usher in the next generation of optical communications. Credit: Chris Kim

According to new research from the USC Viterbi School of Engineering, recently published in *Nature Photonics*, adding two lasers together as a sort of optical "it couple" promises to make wireless communications faster and more secure than ever before. But first, a little background.

Most laser-based communications—think fiber optics, commonly used for things like high-speed internet—is transmitted in the form of a laser (optical) beam traveling through a cable. Optical communications is exceptionally fast but is limited by the fact that it must travel through physical cables. Bringing the high-capacity capabilities of lasers to untethered and roving applications—such as to airplanes, drones, submarines, and satellites—is truly exciting and potentially game-changing.

The USC Viterbi researchers have gotten us one step closer to that feat by focusing on something called Free Space Optical Communication (FSOC). This is no small feat, and it is a challenge researchers have been working on for some time. One major roadblock has been something called "atmospheric turbulence."

As a single optical laser beam carrying information travels through the air, it experiences natural turbulence, much like a plane does. Wind and temperature changes in the atmosphere around it cause the beam to become less stable. Our inability to control that turbulence is what has prevented FSOC from advancing in performance similar to radio and optical fiber systems. Leaving us stuck with slower old radio waves for most wireless communication.

"While FSOC has been around a while, it has been a fundamental challenge to efficiently recover information from an optical beam that has been affected by atmospheric turbulence," said Runzhou Zhang, the lead author and a Ph.D. student at USC Viterbi's Optical Communications Laboratory in the Ming Hsieh Department of Electrical and Computer Engineering.

The researchers made an advance to solving this problem by sending a second laser beam (called a "pilot" beam) traveling along with the first to act as a partner. Traveling as a couple, the two beams are sent through the same air, experience the same turbulence, and have the same distortion. If only one beam is sent, the receiver must calculate all the distortion the beam experienced along the way before it can decode the data. This severely limits the system's performance.

But, when the pilot beam travels alongside the original beam, the distortion is automatically removed. Like Kermit duetting "Rainbow Connection" with Miss Piggy, the information in that beam arrives at its destination clear, crisp and easy to understand.

From an engineering perspective, this accomplishment is no small feat. "The problem with radio waves, our current best bet for most wireless communication, is that it is much slower in data rate and much less secure than optical communications," said Alan Willner, team lead on the paper and

USC Viterbi professor of electrical and computer engineering. "With our new approach, we are one step closer to mitigating turbulence in high-capacity optical links."

Perhaps most impressively, the researchers did not solve this problem with a new device or material. They simply looked at the physics and changed their perspective. "We used the underlying physics of a well-known device called a photo detector, usually used for detecting intensity of light, and realized it could be used in a new way to make an advance towards solving the turbulence problem for laser communication systems," said Zhang.

Think about it this way: When Kermit and Miss Piggy sing their song, both their voices get distorted through the air in a similar way. That makes sense; they're standing right next to each other, and their sound is traveling through the same atmosphere. What this photo detector does is turn the distortion of Kermit's voice into the opposite of the distortion for Miss Piggy's voice. Now, when they are mixed back together, the distortion is automatically canceled in both voices and we hear the song clearly and crisply.

With this newly realized application of physics, the team plans to continue exploring how to make the performance even better. "We hope that our approach will one day enable higher-performance and secure wireless links," said Willner. Such links may be used for anything from high-resolution imaging to high-performance computing.

More information: Runzhou Zhang et al, Turbulence-resilient pilot-assisted self-coherent free-space optical communications using automatic optoelectronic mixing of many modes, *Nature Photonics* (2021). DOI: 10.1038/s41566-021-00877-w

Journal information: Nature Photonics

https://phys.org/news/2021-10-optical-pairing-wireless.html

COVID-19 Research News

Sat, 23 Oct 2021

Brain fog in Covid-19 patients can persist for months, even in those who were not hospitalized, study finds

By Jacqueline Howard

*(CNN)*Cognitive impairment -- described as brain fog -- can persist for months in Covid-19 patients, even for some who were not hospitalized, according to a new study.

The research, published Friday in the journal JAMA Network Open, found that nearly a quarter of Covid-19 patients in a Mount Sinai Health System registry experienced some issues with their memory -- and although hospitalized patients were more likely to have such brain fog after a coronavirus infection, some outpatients had cognitive impairment too.

"In this study, we found a relatively high frequency of cognitive impairment several months after patients contracted COVID-19. Impairments in executive functioning, processing speed, category fluency, memory encoding, and recall were predominant among hospitalized patients," Jacqueline Becker and her colleagues at the Icahn School of Medicine at Mount Sinai in New York, wrote in the study.

"This pattern is consistent with early reports describing a dysexecutive syndrome after COVID-19 and has considerable implications for occupational, psychological, and functional outcomes," the researchers wrote. Separate research, published in April in the journal Lancet Psychiatry, found that as many as 1 in 3 people with Covid-19 had longer term mental health or neurological symptoms.

The U Centers for Disease Control and Prevention includes difficulty thinking or concentrating -- sometimes referred to as "brain fog" -- on its list of post-Covid conditions.

"Although most people with COVID-19 get better within weeks of illness, some people experience post-COVID conditions," the CDC notes on its website. "Post-COVID conditions are a wide range of new, returning, or ongoing health problems people can experience four or more weeks after first being infected with the virus that causes COVID-19."

The new study included data, from April 2020 through May 2021, on 740 Covid-19 patients with no history of dementia. The average age of patients was 49. Cognitive functioning was assessed for each patient and the researchers analyzed the frequency of cognitive impairment among the patients.

Among all the patients, the researchers found that 15% showed deficits in phonemic fluency in their speaking; 16% in a set of mental skills called their executive functioning; 18% showed deficits in their cognitive processing speed; 20% in their ability to process categories or lists; 23% in memory recall and 24% in memory encoding, among other impairments.

The researchers noted that hospitalized patients were more likely to have impairments in attention, executive functioning, category fluency and memory.

For instance, when it came to memory recall, the researchers found 39% of hospitalized patients had impairment in that area compared with 12% of outpatients. When it came to memory encoding, the data showed that 37% of hospitalized patients had impairment compared with 16% of outpatients.

The authors noted the possibility for bias in the sample because patients came to Mount Sinai Health System because they were experiencing symptoms.

"The association of COVID-19 with executive functioning raises key questions regarding patients' long-term treatment," the researchers wrote. "Future studies are needed to identify the risk factors and mechanisms underlying cognitive dysfunction as well as options for rehabilitation."

https://edition.cnn.com/2021/10/22/health/brain-fog-covid-19-patients-study-wellness/index.html