Mar
2021

समाचार पत्रों से चयित अंश
Newspapers Clippings

A Daily service to keep DRDO Fraternity abreast with DRDO Technologies, Defence Technologies, Defence Policies, International Relations and Science & Technology

खंड : 46 अंक : 48 06-08 मार्च 2021

Vol.: 46 Issue : 48 06-08 March 2021

रक्षा विज्ञान पुस्तकालय
Defence Science Library
रक्षा वैज्ञानिक सूचना एवं प्रलेखन केंद्र
Defence Scientific Information & Documentation Centre
मेटकॉफ हाउस, दिल्ली - 110 054
Metcalfe House, Delhi - 110 054

CONTENTS

DRDO News

DRDO Technology News

Press Information Bureau
Government of India

Ministry of Defence

Fri, 05 March 2021 3:26PM

DRDO conducts successful flight test of Solid Fuel Ducted Ramjet

Defence Research and Development Organisation (DRDO) successfully carried out a flight demonstration based on Solid Fuel Ducted Ramjet (SFDR) technology from Integrated Test Range Chandipur off the coast of Odisha at around 1030 hrs on March 05, 2021. All the subsystems, including the booster motor and nozzle-less motor, performed as expected. During the test, many new technologies were proven, including Solid Fuel based Ducted Ramjet technology.

Successful demonstration of Solid Fuel based Ducted Ramjet technology has provided DRDO with a technological advantage which will enable it to develop long range air-to-air missiles. At present, such technology is available only with a handful of countries in the world. During the test, air launch scenario was simulated using a booster motor. Subsequently, the nozzle-less booster accelerated it to the required Mach number for Ramjet operation.

The performance of the missile was monitored using the data captured by Electro Optical, Radar and Telemetry instruments deployed by ITR and confirmed successful demonstration of the mission objectives. The launch was monitored by senior scientists of various DRDO labs, including Defence Research & Development Laboratory (DRDL), Research Centre Imarat (RCI) and High Energy Materials Research Laboratory (HEMRL).

Raksha Mantri Shri Rajnath Singh congratulated the Scientists of DRDO, Indian Air Force and the Industry on the successful flight test of SFDR.

Secretary Department of Defence R&D and Chairman DRDO Dr G Satheesh Reddy also congratulated the team involved in the successful flight test.

https://pib.gov.in/PressReleasePage.aspx?PRID=1702670

पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Fri, 05 March 2021 3:26PM

डीआरडीओ ने सॉलिड फ्यूल डक्टेड रैमजेट का सफल उड़ान परीक्षण किया

रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) ने दिनांक 05 मार्च, 2021 को सुबह करीब 10.30 बजे ओडिशा के तट से दूर एकीकृत परीक्षण रेंज चांदीपुर से सॉलिड फ्यूल डक्टेड रैमजेट (एसएफडीआर) प्रौद्योगिकी पर आधारित फ्लाइट टेस्ट को सफलतापूर्वक अंजाम दिया। बूस्टर मोटर और नोजल रहित मोटर समेत सभी उप प्रणालियों ने अपेक्षा के अनुसार प्रदर्शन किया। परीक्षण के दौरान, ठोस ईंधन आधारित डक्टेड रैमजेट प्रौद्योगिकी सहित अनेक नई प्रौद्योगिकियों का परीक्षण साबित हुआ।

ठोस ईंधन आधारित डक्टेड रैमजेट तकनीक के सफल प्रदर्शन ने रक्षा अनुसंधान एवं विकास संस्थान (डीआरडीओ) को तकनीकी लाभ प्रदान किया है जिससे वह लंबी दूरी की हवा से हवा में मिसाइलें विकसित कर पाएगा। वर्तमानमें ऐसी तकनीक सिर्फ दुनिया के गिने-चुने देशों के पास ही उपलब्ध है। परीक्षण के दौरान, एयर लॉन्च परिदृश्य को बूस्टर मोटर का उपयोग करके सिम्युलेट किया गया था। बाद में नोजल रहित बूस्टर ने इसको रैमजेट ऑपरेशन के लिए आवश्यक मैक नंबर पर त्वरित किया।

मिसाइल के प्रदर्शन की निगरानी आईटीआर द्वारा तैनात इलेक्ट्रोऑप्टिकल, रडार और टेलीमेट्री उपकरणों द्वारा कैप्चर किए गए आंकड़ों का उपयोग करके की गई थी और मिशन के उद्देश्यों के सफल प्रदर्शन की पुष्टि हुई। इस प्रक्षेपण की निगरानी रक्षा अनुसंधान एवं विकास प्रयोगशाला (डीआरडीएल), अनुसंधान केंद्र इमरत (आरसीआई) और हाई एनर्जी मैटेरियल रिसर्च लेबोरेट्री (एचईएमआरएल) सहित विभिन्न रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) प्रयोगशालाओं के वरिष्ठ वैज्ञानिकों ने की।

रक्षा मंत्री श्री राजनाथ सिंह ने सॉलिड फ्यूल डक्टेड रैमजेट (एसएफडीआर) के सफल उड़ान परीक्षण पर रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ), भारतीय वायु सेना और उद्योग के वैज्ञानिकों को बधाई दी।

रक्षा आनुसंधान एवं विकास विभाग के सचिव और रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) के अध्यक्ष डॉ जी सतीश रेड्डी ने भी सफल उड़ान परीक्षण में शामिल टीम को बधाई दी।

https://pib.gov.in/PressReleasePage.aspx?PRID=1702744

Business Standard

Sat, 06 March 2021

DRDO joins exclusive club after long-range air-to-air missile test

Technology available 'only with a handful of countries', says defence ministry

By Ajai Shukla

New Delhi: A successful test on Friday of the technologies that go into a "solid fuel ducted ramjet" (SFDR) has propelled the Defence Research and Development Organisation (DRDO) into an exclusive group of manufacturers that can build long-range air-to-air missiles (AAM) capable of shooting down enemy aircraft hundreds of kilometres away.

The DRDO has already impressed the Indian Air Force (IAF) with its home-grown Astra medium-range AAM. The IAF is planning to equip the Tejas Mark 1A fighter with the Astra Mark 1, enabling it to strike airborne targets at ranges of 60-70 km.

The Tejas Mark 2 fighter will field the Astra Mark 2, which DRDO sources say will have a range of 150-160 km, making it the Indian equivalent of the Meteor AAM that equips the Rafale fighter. But the real capability leap will come with the SFDR-based AAM, which top DRDO officials say will have a range of 350 km.

DRDO carried out a flight demonstration based on the SFDR technology from the Integrated Test Range at Chandipur off the coast of Odisha on Friday | PTI

Fighter aircraft grab attention with their aerodynamic performance, but their combat capability depends more on the range of their AAMs. When the Pakistan Air Force (PAF) shot down an Indian MiG-21 fighter the day after the Balakot strike in February 2019, it was because the AMRAAM missiles carried by the PAF's F-16 fighters outranged the IAF MiG-21s' missiles. Since then, the IAF has tried to ensure their fighters enjoy a missile advantage.

The Ministry of Defence (MoD) announced that the flight demonstration, carried out off the coast of Odisha on Friday, validated key missile subsystems, including the booster motor, nozzle-less motor and the basic SFDR technology.

"Successful demonstration of SFDR technology has provided DRDO with a technological advantage which will enable it to develop long-range AAMs. At present, such technology is available only with a handful of countries," said the MoD.

Briefing *Business Standard* on the potential of the SFDR technology-based AAM, officials involved in its development said that the missile, just like the Meteor, always flew at supersonic speeds. High speeds enable high manoeuvrability and ensure the target aircraft cannot get away.

"The SFDR flies at supersonic Mach numbers that are higher than current aircraft, So even tail chase is possible. This widens the missile's 'no escape zone', which is the envelope within which the missile, once it locks onto the target, does not let its target get away.

"The SFDR's propulsion system is designed to provide high specific impulse beyond 1,000 seconds, which will enable us to get longer ranges," said a senior DRDO official.

The high velocity of the SFDR-based AAM also increases its range, explained the official. "Suppose I have detected a target 200 km away and I've launched my missile. Its incredibly high velocity generates a lot of kinetic energy. Even after the missile's propellant is consumed, it still has enough momentum to keep travelling towards the target and to explode the warhead in his vicinity."

The DRDO intends to develop SFDR as a technology with multiple applications, including air-to-air; and tactical surface-to-air against enemy aircraft.

The DRDO initially began developing SFDR technologies as a joint development project with Russia's defence export agency, Rosoboronexport. After jointly developing state-of-the-art propulsion technology, and high-tech sub-systems such as a nozzle-less booster, fuel flow controller and boron-based sustainer, the DRDO is now going it alone.

https://www.business-standard.com/article/current-affairs/drdo-joins-exclusive-club-after-long-range-air-to-air-missile-test-121030501399_1.html

Hindustan Times

Sat, 06 March 2021

DRDO successfully tests SFDR technology in a bid to develop long-range missiles

It said that the test was carried out using a booster motor to simulate an air-launch scenario. The nozzle-less booster propelled the missile to the required Mach number for Ramjet operation

Edited By Shankhyaneel Sarkar

New Delhi: The Defence Research and Development Organisation (DRDO) on Friday said it has successfully tested a flight demonstration based on Solid Fuel Ducted Ramjet (SFDR) technology from the Integrated Test Range in Odisha's Chandipur. The SFDR technology will help DRDO with the technological advantage to develop long-range air-to-air missiles (AAMs).

DRDO in a statement also said that only a handful of countries have such a technology. It said that the test was carried out using a booster motor to simulate an air-launch scenario. The nozzle-less booster propelled the missile to the required Mach number for Ramjet operation.

DRDO in a statement also said that only a handful of countries have such a technology after successfully tested a flight demonstration based on Solid Fuel Ducted Ramjet (SFDR) technology. (DRDO/PIB)

"The performance of the missile was monitored using the data captured by Electro Optical, Radar and Telemetry instruments deployed by ITR and confirmed successful demonstration of the mission objectives. The launch was monitored by senior scientists of various DRDO labs, including Defence Research & Development Laboratory (DRDL), Research Centre Imarat (RCI) and High Energy Materials Research Laboratory (HEMRL)," DRDO said in its statement.

According to a report by the International Institute for Strategic Studies (IISS), Ramjet powered missiles provide greater range and a higher average speed compared to missiles powered by solid propellants. The report also said that ramjet missiles use atmospheric oxygen rather than including an oxidizer as part of the solid motor. Another report on the website Popular Mechanics points out that Ramjet Missiles can carry a bigger warhead as they do not have to carry an oxidizer.

DRDO began developing SFDR first in 2017 and had conducted successful tests in 2018 and 2019 as well. After Friday's successful testing, defence minister Rajnath Singh congratulated Scientists of DRDO, the Indian Air Force (IAF) and the defence industry. Satheesh Reddy, DRDO's Chairperson, also applauded the team after the successful testing of the SFDR technology.

https://www.hindustantimes.com/india-news/drdo-successfully-tests-sfdr-technology-in-a-bid-to-develop-long-range-missiles-101614947414299.html

THE NEW INDIAN EXPRESS

Sat, 06 March 2021

India successfully tests ramjet technology to help develop long range air to air missiles

Defence sources said a prototype of an air-to-air missile based on the technology was test-fired from the Integrated Test Range (ITR) at about 10.30 am to gauge the performance of the system

By Hemant Kumar Rout

Bhubaneswar: India on Friday successfully carried out a flight demonstration based on Solid Fuel Ducted Ramjet (SFDR) technology from a defence facility off the Odisha coast paving the way for development of long range air to air missiles.

Defence sources said a prototype of an air-to-air missile based on the technology was test-fired from the Integrated Test Range (ITR) at about 10.30 am to gauge the performance of the system.

Solid Fuel Ducted Ramjet technology being tested from the ITR off the Odisha coast on Friday (Photo | Special arrangement)

An air launch scenario was simulated by the ground booster during the test and the missile was guided to high altitude to simulate aircraft release conditions. Subsequently the nozzle-less booster was ignited and it accelerated the system to the required Mach number for ramjet operation.

All the subsystems including the ground booster motor and nozzle-less motor performed as expected. The separation of the ground booster was also perfect.

"The successful demonstration of the technology will enable DRDO to develop long range air to air missiles. So far such technology is available only with a handful of countries in the world," a defence official told *The New Indian Express*.

Many new technologies including solid fuel based ducted ramjet technology were proven during the test. The performance of the missile was monitored using the data captured by electro optical, radar and telemetry instruments deployed by ITR and confirmed successful demonstration of the mission objectives.

The air breathing ramjet technology will propel long range air-to-air to engage with targets at supersonic speed. This was the third test of the technology. The first and second tests were conducted in 2018 and 2019 respectively.

The launch was monitored by senior scientists of various DRDO labs including Hyderabad based DRDL and RCI and Pune based HEMRL.

Secretary of Department of Defence (R&D) and Chairman of DRDO Dr G Satheesh Reddy congratulated the team involved in the mission.

https://www.newindianexpress.com/nation/2021/mar/05/india-successfully-tests-ramjet-technology-to-help-develop-long-range-air-to-air-missiles-2272638.html

Sun, 07 March 2021

DRDO conducts successful flight test of SFDR technology

The successful demonstration of the SFDR missile propulsion system has provided DRDO a technological advantage

By Shailaja Tripathi

The Defence Research and Development Organisation on March 5, 2021, successfully conducted a flight test of the Solid Fuel Ducted Ramjet- SFDR missile propulsion system from the Integrated Test Range in Chandipur, Odisha.

DRDO conducts SFDR flight

According to an official statement from DRDO, all the subsystems, including nozzle less motor and booster motor, performed at the test as expected.

The launch of SFDR was monitored by the senior scientists of various DRDO labs, including Research Centre Imarat, Defence Research, and Development Authority- DRDL, and High Energy Materials Research Laboratory- HEMRL.

The Union Defence Minister Rajnath Singh also congratulated the Indian Air Force and the scientists of DRDO on the successful flight test of Solid Fuel Ducted Ramjet.

Technological advantage to DRDO:

The official statement by DRDO mentioned that the successful demonstration of SFDR technology has provided the Defence Research and Development Organisation a technological advantage which will enable the government organisation in developing long-range air-to-air missiles.

It further added that at present this form of technology is currently available only in a handful of countries.

Flight test of SFDR: Key Details

- The performance of the missile was monitored with the help of data captured by Radar, Electro-Optical, and Telemetry instruments which were deployed by ITR and confirmed the demonstration of the mission objectives.
- During the flight-test, many new technologies, which included Solid Fuel based Ducted Ramjet Technology was also proven during the test.
- At the time of the test, air-launch was stimulated with the use of a booster motor. The nozzle-less booster speeded up it to the required Mach number for the Ramjet operation.

Launch of Sindhu Netra Satellite:

The Sindhu Netra Satellite which has been developed by DRDO was successfully deployed in space on February 28, 2021. The satellite by DRDO is capable of automatically identifying the merchant ships and warships operating in the Indian Ocean Region.

https://www.jagranjosh.com/current-affairs/drdo-conducts-successful-flight-test-of-sfdr-technology-1615101879-1

Sun, 07 March 2021

DRDO की इस टेक्नोलॉजी के सफल टेस्ट के बाद अब भारतीय वायुसेना के लिए तैयार हो सकेंगी खतरनाक मिसाइलें!

इस टेक्नोलॉजी के सफल टेस्ट के साथ ही डीआरडीओ अब दुनिया के कुछ उन चुनिंदा देशों की लिस्ट में शामिल हो गया है जिनके पास लंबी दूरी की हवा से हवा में मिसाइलें विकसित करने की क्षमता है।

डिफेंस रिसर्च एंड डेवलपमेंट ऑर्गनाइजेशन डीआरडीओ ने **5** मार्च यानी शुक्रवार को एक ऐसी टेक्नोलॉजी का सफल परीक्षण किया है जिसके बाद भारत को लंबी रेंज की मिसाइल को डेवलप करने में सफलता मिल सकेगी। ओडिशा के इंटीग्रेटेड टेस्ट रेंज से सॉलिड फ्यूल डक्टेड रैमजेट (SFDR) टेक्नोलॉजी पर आधारित फ्लाइट टेस्ट को सफलतापूर्वक अंजाम दिया।

डीआरडीओ अब दुनिया के कुछ चुनिंदा देशों की लिस्ट में शामिल हो गया है

बूस्टर मोटर और नोजल रहित मोटर समेत बाकी सभी टेक्नोलॉजी भी उम्मीद के मुताबिक प्रदर्शन पर खरी उतरीं। टेस्ट के दौरान, सॉलिड फ्यूल आधारित डक्टेड रैमजेट टेक्नोलॉजी के साथ ही बाकी टेक्नोलॉजी का टेस्ट भी सही साबित हुआ। इस सफल टेस्ट के साथ ही भारतीय वायुसेना और ज्यादा ताकतवर हो गई है।

दुनिया के चुनिंदा देशों में आया भारत

इस टेक्नोलॉजी के सफल टेस्ट के साथ ही डीआरडीओ अब दुनिया के कुछ उन चुनिंदा देशों की लिस्ट में शामिल हो गया है जिनके पास लंबी दूरी की हवा से हवा में मिसाइलें विकसित करने की क्षमता है। अभी यह टेक्नोलॉजीअभी फिलहाल कुछ ही देशों के पास है। इस टेस्ट के दौरान एयर लॉन्च परिदृश्य को बूस्टर मोटर का प्रयोग करके सिम्युलेट किया गया था।

इसके बाद नोजल रहित बूस्टर ने इसको रैमजेट ऑपरेशन के लिए आवश्यक मैक नंबर पर लॉन्च किया गया। टेस्ट के दौरान आईईटीआर द्वारा तैनात इलेक्ट्रो ऑप्टिकल, रडार और टेलीमेट्री उपकरणों द्वारा हासिल किए गए आंकड़ों का प्रयोग करके की गई थी।

इस पूरे मिशन के उद्देश्यों के सफल प्रदर्शन की पुष्टि हुई। इस सफल टेस्ट में डीआरडीओ की निगरानी रक्षा अनुसंधान एवं विकास प्रयोगशाला (डीआरडीएल), अनुसंधान केंद्र इमरत (आरसीआई) और हाई एनर्जी मैटेरियल रिसर्च लेबोरेट्री (एचईएमआरएल) के साथ ही डीआरडीओ के वैज्ञानिक भी शामिल थे।

टेस्ट के बाद रक्षा मंत्री राजनाथ सिंह ने डीआरडीओ समेत इंडियन एयरफोर्स और रक्षा क्षेत्र के वैज्ञानिकों को बधाई दी।

बढ़ जाती है किसी मिसाइल की रेंज

एसएफडीआर मिसाइल का प्रपोलशन सिस्टम है। इस सिस्टम में थर्स्ट मॉड्यूलेशन को हॉट गैस कंट्रोलर की मदद से हासिल किया जाता है। साल 2017 तक मिसाइल सिस्टम की रेंज करीब **8** किलोमीटर ऊंचाई पर करीब **120** किलोमीटर तक थी। अगर स्पीड की बात करें तो मिसाइल की स्पीड **2.3** मैक से **2.5** मैक तक थी।

इंटरनेशनल इंस्टीट्यूट फॉर स्ट्रैटेजिक स्टडीज (IISS) के मुताबिक इस तरह का प्रपोलशन सिस्टम औसतन ज्यादा रफ्तार पर किसी मिसाइल की रेंज में भी इजाफा कर देता है।

मिसाइल जिनमें इस तरह का सिस्टम प्रयोग किया जाता है उनमें ऑक्सीडाइजर के बिना भी भारी हथियार ले जाने की क्षमता होती है। रैमजेट टेक्नोलॉजी वाली मिसाइलें उड़ान के दौरान वातावरण की ऑक्सीजन का प्रयोग करती हैं।

अब वायुसेना के लिए आएंगी घातक मिसाइलें

इस टेक्नोलॉजी की मदद से आने वाले समय में इंडियन एयरफोर्स को और ज्यादा फायदा होगा। वायुसेना के लिए तैयार होने वाली मिसाइलों को रैमजेट टेक्नोलॉजी से बड़ी सहायता मिलेगी। हालांकि इस टेक्नोलॉजी का प्रयोग जमीन से हवा तक हमला कर सकने वाली मिसाइलों में भी हो सकता है। एसएफडीआर पर साल 2013 में काम होना शुरू हुआ था।

इस टेक्नोलॉजी को पांच साल के अंदर पूरा होना था और इसके बाद इसका टेस्ट होना था। लेकिन इसमें किन्हीं वजहों से देरी हो गई। फिलहाल अब जबकि इस टेक्नोलॉजी का सफल परीक्षण हो चुका है तो माना जा रहा है कि आने वाले दिनों में वायुसेना की क्षमताओं में इजाफा होगा।

https://www.tv9hindi.com/knowledge/drdo-successfully-carried-out-a-flight-demonstration-of-based-on-ramjet-technology-sfdr-569299.html

THE WEEK

Sat, 06 March 2021

BrahMos is ready to meet all export requirements

Interview/ Sudhir Kumar Mishra, CEO and managing director, BrahMos Aerospace

By Pradip R Sagar

Defence exports worth $5 billion by 2024. Is it realistic?

Looking at the maturity of our defence technology, this goal seems quite realistic and is also the need of the hour. The government is very proactive on the defence exports front. And I firmly believe that now is the time when 70 years of investment in defence R&D should be paid back. As defence scientists and technologists, we can repay our nation with indigenous technology development, revenue generation and employment creation. The $5-billion export target would encourage the Indian defence and aerospace industries to gain entry into newer markets for their long-term, sustainable growth prospects.

To achieve this target, what support are you getting from the government?

The government's main objective here is to facilitate defence exports. Some time ago, our defence attaches [had been instructed] to be proactive on the military exports front. As a result, we are getting several inquiries about our weapon systems and their export potential.

Sudhir Kumar Mishra | Bhanu Prakash Chandra

If we look at manufacturing, a huge capability has been created in the defence technology sector. These manufacturing capabilities need to be completely exploited to create wealth and generate employment. It would lead to next generation technology development within the country.

How does BrahMos Aerospace fit into this?

Defence sales are mostly government-to-government business, and hence, it is a prerogative of the government to find out whom to export to or with which nation we can negotiate. This is because export of defence products is often a strategic decision. So, we are completely aligned with any such thinking of our government. BrahMos Aerospace is fully geared to meet all export

requirements even while fulfilling the needs of our armed forces, as we have a robust manufacturing capability.

I also feel that for the first time, we are being greatly encouraged by our government to actively take part in national and international defence exhibitions. While doing so, we are learning the tricks of [defence] trade and export.

Will the export version of BrahMos be different from what our armed forces are using?

Every nation has its own defence strategy. So, it solely depends on the customer on what kind of system it wants. There cannot be anything superior or inferior.

Could you share some of the future plans of BrahMos Aerospace?

Last year, we came out with a new version of BrahMos that is designed for coastal security. It is a shore-based weapon system and the Indian Navy has taken approval from the DAC (defence acquisition council) to deploy this system to safeguard India's vast coastlines. BrahMos is reinventing itself almost every year by coming out with different versions to meet the requirements of the Indian armed forces. Looking into the future, we believe that BrahMos can be re-engineered and with reduced dimensions and other features, we can develop the BrahMos NG (next-generation) version. This NG can be integrated into the Light Combat Aircraft and the Advanced Medium Combat Aircraft (AMCA) as well as on other platforms like the MiG-29 and Sukhoi-30. In a few years, we hope to come out with a hypersonic missile which will be able to travel for longer distances and longer duration as well.

Please throw some light on capabilities of BrahMos

BrahMos is a supersonic cruise missile with a range of 290km. We have developed (variants). It can be launched from sea, sub-sea, land and air. We can launch it against land and ship targets. BrahMos has become the most trusted weapon in the Indian military's armoury. It has the capability to destroy a target as large as a frigate. BrahMos has validated its immense destructive potential several times during a series of successful test firings conducted by the armed forces last year.

https://www.theweek.in/theweek/current/2021/03/04/brahmos-is-ready-to-meet-all-export-requirements.html

THE WEEK

Sat, 06 March 2021

Ready to sell

India is set to become a competitive exporter in the global defence market

By Pradip R Sagar

In February 2020, Prime Minister Narendra Modi set a target for Indian defence exports: $5 billion by 2024. Last month, the Union cabinet cleared the export of Akash missile systems and formed a high-powered panel to grant swift approval to export military hardware. Besides Akash, surface-to-air missile systems, the BrahMos supersonic cruise missile and larger weapon systems can now be sold to "friendly foreign" nations that have a robust system to manage these assets. It will also help improve strategic ties with them. Until now, India has only exported ordnance and smaller armaments.

In demand: The Akash Mk-1 on display at the Republic Day parade in 2018 | AP

Experts believe that apart from Akash and BrahMos, other missiles like Prahaar and the air-to-air Astra have huge export potential. Astra, which has a range of 100km, is now entering the production stage after completing successful trials from the

Sukhoi Su-30MKI jet. Two things hampered the sale of indigenously developed missiles: the lack of effort to sell and a strong lobby of First-World nations that dominates defence markets. India also lacked a policy to push defence exports, despite defence scientists seeking export permission since 2005.

Interestingly, from 2015 to 2019, India was the world's second-largest importer of weapons, after Saudi Arabia. India imported 9.2 per cent of the arms produced globally. India did though manage to export defence equipment worth Rs.10,745 crore in 2018-19, seven times the figure in 2016-17.

> According to an observer in South Block, efforts are on to fast-track the long-promised sale of BrahMos and Akash to Vietnam.

According to an observer in South Block, efforts are on to fast-track the long-promised sale of BrahMos and Akash to Vietnam. This deal with China's neighbour is also a clear message to Beijing.

India's missile programme took off in 1982, when Prime Minister Indira Gandhi decided to develop indigenous missile systems. She formed a Missile Study Team with A.P.J. Abdul Kalam as its head. The team recommended the phased development of five missiles—Trishul and Akash surface-to-air missiles, Nag anti-tank missile, Prithvi short-range ballistic missile and Agni.

Four decades on, the Philippines, Indonesia, Vietnam, the UAE, Bahrain, Saudi Arabia, Egypt, Kenya and Algeria have expressed their interest in the Akash, which is capable of targeting aerial assets within a range of 25km. The missile was inducted into the Indian Air Force in 2014 and the Army in 2015. Defence officials claim that Akash is around 50 per cent cheaper than its competitors. Other Indian systems like radars and sonars, too, cost only a quarter to one-fifth of similar systems available in the global market. All export versions will be different from the ones inducted into the Indian armed forces, as no country sells the best variant.

The 290-km range BrahMos, which has a range of 290km, is being eyed by Indonesia, the UAE, Saudi Arabia, South Africa, Vietnam and the Philippines. All formalities have been completed with the Philippines—including a green light from Russia, as the missile development project was a joint venture—and the matter is awaiting final approval from the cabinet committee for security.

William Selvamurthy, a scientist who served as chief controller of research and development at the Defence Research and Development Organisation, says that India was running First World industries because it has the world's fourth-largest air force and its requirements are huge. "There was a lot of pressure on India to not develop missile systems," said Selvamurthy. "Countries dominating the field of missile technology do not want any other player in the global market. They had put restrictions under non-proliferation treaties." He said India is now strong enough to make a decision. "With selling missiles, we will be competing with the US, Russia and other European nations," he said.

Retired Air Vice Marshal P.K. Srivastava, who served in Bharat Dynamics Limited (BDL), the manufacturer of the Akash, says that it took close to 20 years for the missile to reach this stage. It took a lot of time to progress from design drawing to production drawing, he said, followed by about 1,000 corrections and modifications before it was finally inducted into the armed forces. So far, the armed forces have ordered Akashs worth Rs24,000 crore; a Rs10,000-crore contract is in the works.

"Initially, we (BDL) wanted to set up the whole supply chain by involving private players and go for bigger numbers later," said Srivastava. "I feel the time is now ripe for us to (export). We must pitch Akash as the cheapest in its category. We can give Israel a good fight, which also sells cheap military platforms in the segment."

He added that there was no policy to export as India never intended to sell. "We always had the capacity, but never thought of exploiting it," he said. As talks are on about upgrading the Akash to the Mk-II variant, the Mk-I can be safely sold.

On the export potential of BrahMos, India is considering multiple options. A. Sivathanu Pillai, architect of the BrahMos missile, told THE WEEK that the priority was to first meet the

requirement of Indian defence forces. During his tenure as chief of BrahMos, nearly 14 countries expressed interested in the missile.

Pillai said that as India is now a member of the Missile Technology Control Regime (MTCR), it can sell missiles with a range beyond 300km. “We are definitely interested in exporting, but not the best systems,” said Pillai. “In the case of exporting the Akash, of which other versions are available, there should not be any issue. But while exporting a BrahMos-type missile, which is a ‘winning weapon’, we need to be careful.”

BrahMos NG, which has a limited range, can be exported, he said. The BrahMos’s range is now being extended to over 400km; efforts are under way to test an 800km variant by the end of this year. The Indian armed forces have placed a Rs36,000-crore order for the BrahMos.

Pillai also highlighted an additional issue: “If we go in for exports, our priority may be shifted because of multiple government-to-government agreements. Our mind will be diverted if the focus is on selling.”

Former DRDO scientist Ravi Gupta partly blames the armed forces for preventing exports. He said unless a weapons system is inducted in significant numbers at home, external buyers will not trust the platform. “Sadly, we were the only country in the world which was working against its own national interest,” said Gupta. “In India, the induction of a military platform takes more time than its development.” He added that because of huge kickbacks in defence deals, the indigenous sector did not get the desired attention.

The situation is changing fast as many indigenous platforms, including the recently approved Tejas light combat aircraft, have been ordered for the armed forces. There is an effort to cut imports and bring the indigenous defence industries together to meet the demand at home.

Defence Scientists have maintained that India is considerably self-reliant, and that once we start exporting, a market will be formed outside and private players can also join. “Not only defence PSUs, but private sectors of the Indian defence industry, too, have grown,” said Selvamurthy. “The ecosystem has changed and it is time to go in for exports.”

https://www.theweek.in/theweek/current/2021/03/04/ready-to-sell.html

WION

Sat, 06 March 2021

India-Philippines BrahMos pact: A deal that sends message to China

Story Highlights

This region the South China Sea has become one of the biggest flashpoints, not just in Asia, but the entire world. China claims the whole of the South China Sea. Five other countries make overlapping claims-- the Philippines, Malaysia, Indonesia, Brunei and Vietnam.

New Delhi: India has taken a major step towards becoming an arms exporter. India has signed a key pact with the Philippines for the sale of "defence material and equipment", which are likely to include BrahMos cruise missiles.

BrahMos Photograph:(AFP)

This is a significant development for two reasons. One the Philippines could be India’s first client for its missile system and second those Indian arms could protect the Philippines against Beijing in the South China Sea.

This region the South China Sea has become one of the biggest flashpoints, not just in Asia, but the entire world. China claims the whole of

the South China Sea. Five other countries make overlapping claims-- the Philippines, Malaysia, Indonesia, Brunei and Vietnam.

And that is the essence of the conflict over the South China Sea. So the Philippines is pitted against China. India is selling arms to the Philippines. That should explain the strategic significance of this deal. A country that's responding to the Chinese threat with a call for self-reliance.

India and the Philippines have signed what is called an "implementing agreement". It dictates the terms and sets the foundation for government to government contracts. But as far as the Philippines is concerned, It wants the BrahMos Missile. The country's defence secretary Delfin Lorenzana witnessed the signing ceremony on Tuesday. In no uncertain terms he has declared and I am quoting.

"We are buying the BrahMos missiles". Now the next step for the Philippines is to discuss a deal to procure the BrahMos.

Why does Manila want this Indian missile?

The BrahMos is considered to be the fastest supersonic missile in the world. Supersonic, means faster than the speed of sound and the BrahMos is known to be a leader in that category of missiles.

Reports say it travels at three times the speed of sound. It can be fired from ships, submarines. Aircraft and ground launchers, the missile itself has a range of 290 kilometres. The Philippines wants to use the BrahMos system for coastal defence and ground attack. A clear vulnerability considering the growing Chinese aggression in the South China Sea. In January China had passed a law. It gave its coastguard powers to open fire on foreign vessels.

The Philippines filed a strong diplomatic protest over the move. Its foreign minister shot off a tweet, calling the law "a verbal threat of war". The Philippines feel the need to step up its defences along the coast.

And India wants to help experts believe the BrahMos is will be a good fit for the Philippines.

The Philippines can launch these missiles, not just from land, but also from its ships. India has conducted several tests on the BrahMos. The missiles have been deployed in several strategic locations along the line of control with China.

Reports say they are being integrated for use on the Sukhoi fighter jets too and reason numbers three the cost. India is helping out the Philippines here too.

New Delhi had offered Manila a 100 million dollar soft loan to acquire the missiles in December. That credit line could be extended if required. So it looks like a win-win situation for the Philippines.

What about India?

New Delhi has a lot to gain if this agreement goes through. It gains a footing as a major arms exporter. The agreement in the Philippines is a step towards establishing India's credentials as a competitive exporter in the global defence market.

Already, there is a lot of global interest around the BrahMos. Beyond the Philippines, Vietnam and the United Arab Emirates are said to be keen on buying the Brahmos. Reports say India has held similar conversations with Argentina, Brazil, Indonesia and South Africa as well.

The aim is to touch the target of five billion dollars worth of defence exports by 2025. And it seems like the BrahMos will be the backbone of this mission. But this deal is not just about the arms trade. India's move to sell defence equipment to the Philippines ups the stakes against China.

Indian missiles will allow the Philippines to assert their territorial right in the South China Sea.

https://www.wionews.com/india-news/india-philippines-brahmos-pact-a-deal-that-sends-message-to-china-368326

The EurAsian Times

Sat, 06 March 2021

Can India's BrahMos cruise missile shield the Philippines from China?

By Aakriti Sharma

As India is set to export the world's fastest supersonic cruise missile, BrahMos, to the Philippines, experts are concerned if Manila can actually guard itself against Chinese threats in the South China Sea.

Ever since the reports of an agreement between Philippine defense undersecretary Raymund Elefante and Indian ambassador Shambu Kumaran, which laid the groundwork for Manila to procure the missile, most experts have said that the move will boost the Asian nation's ability to defend its coastal areas.

The details of the procurement have not been revealed yet, but New Delhi had reportedly offered a soft loan of $100 million to Manila to acquire the missiles, in December. Experts believe if a formal deal is signed, the defense credit line may as well be extended, which will help the Philippines in the procurement.

An Indo-Russian joint venture, BrahMos, can be fired from ships, submarines, aircraft, and ground launchers. The initial versions of the missile go up to the range of 290km but last year India tested an extended range of around 400 kilometers, with more versions of higher ranges above 1,000 kilometers currently under development.

After the signing of the contract, the Philippines would be the first buyer of BrahMos, especially under Prime Minister Narendra Modi's vision to expand defense exports. However, will the missile system be enough for the Southeast Asian nation to counter China?

Experts believe the Philippines is both outclassed and outnumbered militarily by China when it comes to asserting its territorial rights in the South China Sea. Philippines President Rodrigo Duterte had accepted the same last year when he had said it was better for the Philippines to pursue "diplomatic endeavors" with China over the South China Sea dispute because "China has the arms" and Manila did not.

Defense Secretary Delfin Lorenzana had admitted that the Philippines was "not yet 25 percent" of the way to achieving minimum credible defense capability. Experts are slamming the decision because the country doesn't have the required infrastructure to ensure that purchases are maintained and manpower is trained to maintain the systems.

It's a sensible argument since the country has been trying to procure missiles for years. Even with BrahMos, experts point out that the country doesn't have a budget to configure the ships to launch them.

The South China Sea Dispute

Bejing claims the entire South China Sea, stretching across 3.6 million square kilometers, as its territory. In 2016, the international arbitration ruling had invalidated most of Beijing's rival claims in the South China Sea.

The Hague tribunal had backed the Philippines in a case on the disputed waters of the South China Sea. It had ruled that rocky outcrops claimed by China – some of which are exposed only at low tide – cannot be used as the basis of territorial claims. The tribunal's ruling said:

"Some of the waters were within the exclusive economic zone of the Philippines because those areas are not overlapped by any possible entitlement of China".

The tribunal had found China violating the Philippines' sovereign rights in those waters by interfering with its fishing and petroleum exploration and by constructing artificial islands.

However, China had refused to accept the ruling. Since then, the militarization and Chinese aggressiveness in the waters poses threat to the Philippines.

https://eurasiantimes.com/can-indias-brahmos-missile-shield-the-philippines-from-china/

International Business Times

Sat, 06 March 2021

What is BrahMos? Philippines looks to fastest cruise missile as China's threat looms

By Meera Suresh

Key Points

- ***The supersonic cruise missile can be fired from submarines, ships, aircraft, or land***
- ***Manila had been looking to acquire cruise missiles following Chinese aggression***
- ***China's sweeping claims of sovereignty in the South China Sea had angered Manila***

Philippines' move to acquire BrahMos, the Indo-Russian supersonic cruise missile which is nearly three times faster than sound, is expected to step up its firepower, especially in the face of the country's growing disputes with China.

Manila and New Delhi Tuesday signed the pact to facilitate government-to-government deals on military hardware, including the potential supply of BrahMos missiles which can travel at a speed of Mach 2.8, reports Hindustan Times.

"We are buying the BrahMos missiles," the report quoted Philippine Defence Secretary Delfin Lorenzana.

File picture of the initial version of BrahMos (Photo: Reuters)

Brahmos, which India test-fired last September, is a two-stage missile with a solid propellant booster as the first stage and a liquid ramjet as the second stage. The missile comes under the 'standoff range weapons' category which helps the attacker to evade defensive fire from the enemy. The latest versions of BrahMos missiles have an extended range of around 400 kilometers, compared to its initial range of 290 kilometers. Advanced versions with higher ranges are in the pipeline.

India has deployed BrahMos missiles along India's land borders. Besides, the supersonic missile can hit sea-based targets beyond the radar horizon. The naval version, successful in both sea-to-sea and sea-to-land modes, can be launched either as a single unit or as a salvo up to eight in numbers, with 2.5-second intervals. The latest version of the cruise missile can also be fired from a submarine, which is around 50 meters below the water surface.

With mounting Chinese aggression, Manila had been looking to acquire cruise missiles for some time. Jose Antonio Custodio, a security and defense consultant, told South China Morning Post that "the opponent here is China."

"We do need these missiles to strengthen our defense against China." He added that the Philippines could mount the BrahMos on ships. "We have the modern ships to launch them, actually," he said. "We have the platforms, like frigates from South Korea, and the Hamilton cutters from the US, but we don't have the budget to configure the ships."

Relations between the two countries have been frosty for some time, with the recent intrusion of Chinese ships into Philippine waters angering Manila. The new Chinese law which authorized its Coast Guard to fire on foreign vessels and structures in Chinese-claimed reefs, had met with stiff protest from the Philippines which described it "virtual declaration of war."

While cash-strapped Manila had earlier decided to shelve the move to procure BrahMos due to the Covid-induced financial situation, reports said New Delhi offered a $100 million line-of-credit to the Philippines.

However, Manila gave no details about how the deal went about.

According to Philippine security blog MaxDefense, funding could be an issue, and "the credit line being extended by India to the Philippines government might be used, and may even be expanded beyond the $100 million credit peak."

India has been aiming to enhance its defense exports to improve strategic relations with friendly foreign countries.

https://www.ibtimes.com/what-brahmos-philippines-looks-fastest-cruise-missile-chinas-threat-looms-3157164

Sat, 06 March 2021

71 बदलावों के साथ और ज्यादा घातक हुए अर्जुन टैंक, जानें अपडेटेड वर्जन की खासियतें

अर्जुन टैंक को सेना में शामिल किए जाने के बाद सेना ने इसके अपडेटेड वर्जन के लिए- 72 तरह के सुधारों की मांग की थी। जिसके बाद डीआरडीओ ने सेना के सुझावों को शामिल करते हुए नया 'हंटर किलर' टैंक अर्जुन मार्क-1ए तैयार किया।

सुमित चौधरी

अर्जुन टैंक के नए वर्जन को सेना में शामिल कर लिया गया है और ये नया टैंक देश की तरफ आंख उठाने वाले देश के दुश्मनों को करारा जवाब देगा।अब आपको बताते हैं कि नया अर्जुन टैंक भारत के लिए कितनी बड़ी उपलब्धि है। इस मेड इन इंडिया टैंक को कैसे दुश्मन के हेलिकॉप्टर उड़ाने, मिसाइलें दागने के सिस्टम से लैस किया गया है, जो थार से लेकर मैदान तक ये मार करने में सक्षम है।

सेना का अर्जुन टैंक

भारतीय सेना की ये शक्ति दुश्मन देशों को दहलाने के लिए काफी है। सेना की 72 मांगें और DRDO के 71 बदलावों के बाद निकला ये मेन बैटल टैंक अब भारतीय सेना की शान बन चुका है। ये अर्जुन MK-1A टैंक थार और मैदान में दुश्मन के छक्के छुड़ा सकता है।

भारत की ये कामयाबी दुश्मन देशों को इसलिए भी चुभ सकती है। क्योंकि दुनियाभर के तमाम लड़ाकू टैंक या तो इसकी बराबरी के हैं या फिर इससे कमतर बात वार की हो या फिर रफ्तार की। अर्जुन टैंक हर मामले में बेजोड़ है। इस आधुनिक अर्जुन टैंक को हंटर किलर भी कहा जाता है क्योंकि ये वो हथियार है जो अपने शिकार को खुद ही तलाश कर लेता है और उन्हें खाक भी कर देता है।

थर्मल इमेजिंग सिस्टम से काम करता है ये टैंक

अर्जुन टैंक को सेना में शामिल किए जाने के बाद सेना ने इसके अपडेटेड वर्जन के लिए- 72 तरह के सुधारों की मांग की थी। जिसके बाद डीआरडीओ ने सेना के सुझावों को शामिल करते हुए नया 'हंटर किलर' टैंक अर्जुन मार्क-1ए तैयार किया। 'अर्जुन मार्क-1ए' अर्जुन टैंक का नया वर्जन है और पहले के वर्जन से

ज्यादा अपग्रेडेड, शक्तिशाली, घातक और विध्वंसक है। अर्जुन टैंक में कुल **71** बदलाव किए गए हैं, जिनमें 40 बड़े बदलाव हैं, जो इसे दुनिया के सर्वश्रेष्ठ टैंक की श्रेणी में लाते हैं।

68 टन वजनी और 58 किलोमीटर प्रतिघंटे की रफ्तार से दौड़ने वाले इस टैंक में लगा गन कंट्रोल सिस्टम और ट्रैक सिस्टम इंजन स्वदेशी हैं। इसमें 1200 एमएम की गन के अलावा 7.62 एमएम और ग्राउंड टार्गेट के लिए 12.7 एमएम की गन लगी है। इससे रात में भी दुश्मन पर नजर रखी जा सकती है, क्योंकि इसमें थर्मल इमेजिंग सिस्टम लगे हैं। इतना ही नहीं। इस अर्जुन टैंक में एंटी एयरक्राफ्ट मशीनगन लगी है जिससे जमीन से ही लड़ाकू हेलिकॉप्टर को मार गिराया जा सकेगा।

अब जल्द ही 118 अर्जुन मार्क-**1**ए टैंकों की दो रेजीमेंट बनेंगी.. दोनों ही रेजीमेंट में 59-59 टैंक होंगे यानी थार से लेकर मैदान तक कहीं पर भी दुश्मन ने नजर डाली तो अर्जुन के वार से उसका बचना मुश्किल ही नहीं बल्कि नामुमकिन होगा।

https://www.tv9hindi.com/india/arjun-tank-becomes-more-deadly-with-71-changes-know-the-features-of-the-updated-version-568653.html

हरिभूमि

Sat, 06 March 2021

वज्र से बढ़ेगी तोपखाने की ताकत

डा॔.एलएस यादव

सेना के तोपखाना बेड़े में 18 फरवरी को उसकी 100वीं तोप के-9 वज्र टी शामिल हो गई है। भारतीय सेना को इस समय 1580 टोड तोपों के अलावा 150 एटैग्स एवं 114 धनुष तोपों की विशेष रूप से जरूरत है। इस तरह सेना को कुल 1800 तोपों की आवश्यकता है। भारतीय सेना लगभग 1600 तोपें खरीदना चाहती है। इसके लिए इजरायल से 400 एथोस तोपें तुरन्त मांगने का विकल्प भी रखा गया है। इसके अलावा फ्रांस से नेक्सटर तोपें भी खरीदी जा सकती हैं। ऐसी तोपें चीन की सीमा या पाकसीमा पर जब तैनात रहेंगी तो दुश्मन का चिन्तित रहना स्वाभाविक है। इनकी तैनाती से भारत का पलड़ा भारी हो गया है।

भारतीय सेना के तोपखाना बेड़े में 18 फरवरी को उसकी 100वीं तोप के-9 वज्र टी शामिल हो गई है। थल सेना प्रमुख जनरल एमएम नरवने ने सूरत में इसे हरी झंडी दिखाकर इसे भारतीय सेना में शामिल किया। भारतीय सेना को मिलने वाली इन तोपों का निर्माण भारत में ही एलएंड टी कंपनी द्वारा किया गया है। स्वदेशी उत्पादन को बढ़ावा देने के लिए इस तोप को गुजरात के हजीरा प्लांट में तैयार किया गया है। के-**9** वज्र टी तोप एक स्वचालित तोप है। इस श्रेणी की तीन तोपों को लेह पहुंचाया जा चुका है। अब उन्हें परीक्षण के लिए अधिक ऊंचाई वाले इलाकों में पहंुचाया जा रहा है। वहां यह देखा जाएगा कि आवश्यकता पड़ने पर इनका उपयोग शत्रु सेना के खिलाफ ऊंचाई वाले क्षेत्रों में किया जा सकता है या नहीं।

इन तोपों की ऊंचे पहाड़ी इलाकों में सफल परीक्षण के बाद भारतीय सेना पर्वतीय अभियानों के लिए इन स्वचालित तोपों की दो या तीन अतिरिक्त रेजिमेंट बनाने के लिए नई खरीद का आर्डर दे सकती है। लार्सन एंड टुब्रो (एलएंडटी) ने सेना को 100 के-9 वज्र टी स्वचालित तोपों की आपूर्ति की है। इनको पिछले दो वर्षों में विभिन्न रेजिमेंटों में तैनात किया गया है। उल्लेखनीय है कि के-**9** वज्र टी तोप दक्षिण अफ्रीका की के-**9** थंडर तोप का स्वदेशी संस्करण है। इस स्वचालित तोप की मारक क्षमता 38 किलोमीटर की दूरी तक की है। यह तोप जीरो रेडियस पर घूमकर चारों तरफ हमला करती है। 155 एमएम 52 कैलिबर की यह तोप

50 टन वजन वाली है। यह 47 किलोग्राम का गोला फेंकने की क्षमता रखती है। मात्र 15 सेकेंड में शत्रु पर यह तीन गोले गिराने में सक्षम है। इसके द्वारा फेंका गया गोला 928 मीटर प्रति सेकेंड यानी एक मिनट में 55680 मीटर की दूरी तय करता है। ऐसी तोपें चीन की सीमा या पाकिस्तान की सीमा पर जब तैनात रहेंगी तो दुश्मन का चिन्तित रहना स्वाभाविक है। इनकी तैनाती से पर्वतीय युद्ध क्षेत्र में भारत का पलड़ा भारी हो गया है।

एलएंडटी द्वारा 100वीं तोप दिए जाने के साथ ही कंपनी नें मई 2017 में रक्षा मंत्रालय द्वारा डसे दिए गए मौजूदा ठेके के तहत सभी तोपों की आपूर्ति सफलता पूर्वक कर लिया है। समय से पहले ऐसा करके कंपनी ने अपने पुराने रिकार्ड को बनाए रखा है। विदित हो कि वर्ष 2017 में एलएंडटी कंपनी और रक्षा मंत्रालय में 4500 करोड़ रुपये का एक करार हुआ था। उसके बाद निर्माण कार्य शुरू किया गया था। इसके कुछ समय बाद प्रधानमंत्री नरेन्द्र मोदी ने जनवरी 2018 में हजीरा में आर्म्ड सिस्टम काॅम्प्लेक्स राष्ट्र को समर्पित किया था। गौरतलब यह है कि एलएंडटी ने के**-9** वज्र टी तोप के लिए वैश्विक बोली के माध्यम से तोप निर्माण का करार हासिल किया था। एलएंडटी दक्षिण कोरियाई रक्षा कंपनी हन्वहा टेकविन डिफेंस के साथ बोली लगाने वाली प्रमुख कंपनी थी। रक्षा मंत्री राजनाथ सिंह पिछले साल जनवरी 2020 में हजीरा में **51**वीं के**-9** बज्र टी तोप को हरी झंडी दिखाई थी। कंपनी ने अपनी मेक इन इंडिया की पहल के तौर पर तोपों के उत्पादन के लिए सूरत के पास हजीरा विनिर्माण परिसर में एक ग्रीनफील्ड निर्माण और परीक्षण की सुविधा की स्थापना की थी। इसका उपयोग दक्षिण कोरिया के अलावा तुर्की, आस्ट्रेलिया, फिनलैंड, नार्वे, एस्तेनिया एवं मिस्र आदि देश करते हैं।

अब तोपों के प्रदर्शन के आधार पर भारतीय सेना दो या तीन अतिरिक्त रेजीमेंट के लिए इन तोेपों की खरीद का आर्डर दे सकती है। ज्ञातव्य है कि वर्श 1986 में भारतीय सेना में शामिल की गई होवित्जर तोपों ने 1999 के कारगिल संघर्ष के समय पाकिस्तानी घुसपैठियों को भगाने में अहम्ा भूमिका निभाई थी, इसलिए ऐसी तोपों की सेना को विशेष आवश्यकता है जो लद्दाख जैसे पर्वतीय इलाके में युद्ध के समय विजयी भूमिका निभा सकें। भारतीय सेना ने लद्दाख क्षेत्र में दुश्मन को मुहंतोड़ जवाब देने के लिए पिछले वर्श एम-777 अल्ट्रा लाइट होवित्जर तोपें तैनात की थीं जिनकी भूमिका ठीक रही थी। भारतीय सेना की यौद्धिक क्षमता को बढ़ाने के लिए रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) इस समय मेक इन इंडिया योजना के तहत एडवांस्ड आर्टिलरी गन सिस्टम होवित्जर तैयार करने का कार्य कर रहा है। अगले साल इन तोपों को भी भारतीय सेना के तोपखाना बेड़े में शामिल किया जा सकता है। डीआरडीओ ऐसी लगभग 200 तोपों के निर्माण की दिशा में काम कर रहा है। अब नई आधुनिक तोपों के आ जाने से लद्दाख में सेना की आर्टिलरी की ताकत कई गुना बढ़ जाएगी।

इससे पहले 20 दिसम्बर 2020 को डीआरडीओ द्वारा विकसित स्वदेशी होवित्जर तोप एटीएजीएस का परीक्षण ओडिशा के बालासोर फायरिंग रेंज में किया गया था जो कि सफल रहा था। डीआरडीओ के एटीएजीएस प्रोजेक्ट डायरेक्टर शैलेन्द्र गाडे के मुताबिक यह दुनिया की सबसे बेहतर किस्म की तोप है। अभी तक किसी दूसरे देश ने ऐसी तोप विकसित नहीं की है। यह एडवांस्ड टावर आर्टिलरी गन 48 किलोमीटर की दूरी से ही अत्यन्त सटीक तरीके से अपने लक्ष्य को भेद सकती है। अगर इस तोप के आॅपरेशनल पैरामीटर की बात की जाए तो यह 25 किलोमीटर प्रति घण्टा मूव कर सकती है। आने वाले दिनों में भारत इनकी तैनाती चीन से लगती सीमा पर अरुणाचल प्रदेश और लद्दाख के ऊंचाई वाले क्षेत्रों में कर सकता है।

गत वर्ष 20 जनवरी 2020 को मध्य प्रदेश स्थित वाहन निर्माणी जबलपुर ने 130 मिलीमीटर पुरानी सारंग तोपों को अपग्रेड करके सेना को सौंप दिया था। अब उन्नत सारंग तोप में 28 के बजाय 38 किलोमीटर की अचूक मारक क्षमता है। इसकी विध्वंसक क्षमता में भी काफी वृद्धि हो गई है। यह

अत्याधुनिक तोप वजन में भी बेहद हल्की है। इसका लाजवाब प्रदर्शन देखकर सैन्य अधिकारी 200 और पुरानी सारंग तोपों के अपग्रेड करने का आदेश दे दिया है।

विदित हो कि भारतीय सेना को इस समय 1580 टोड तोपों के अलावा 150 एटैग्स एवं 114 धनुष तोपों की विशेष रूप से जरूरत है। इस तरह सेना को कुल 1800 तोपों की आवश्यकता है। भारतीय सेना लगभग 1600 तोपें खरीदना चाहती है। इसके लिए इजरायल से 400 एथोस तोपें तुरन्त मांगने का विकल्प भी रखा गया है। इसके अलावा फ्रांस से नेक्सटर तोपें भी खरीदी जा सकती हैं। इन नई तोपों के मिलने से सेना की यह कमी आने वाले दिनों में पूरी हो जाएगी और भारतीय तोपखाना काफी ताकतवर हो जाएगा।

(ये लेखक के अपने विचार हैं।)

https://www.haribhoomi.com/opinion/artillery-strength-will-increase-with-thunderbolt-368776

दैनिक भास्कर

Fri, 05 March 2021

ईडीएमसी: बायो डाइजेस्टर तकनीक से शहर के सीवेज नेटवर्क पर लोड कम होगा और बिजली भी बनाई जा सकेगी

- **डीआरडीओ के बायो डाइजेस्टर तकनीक पर तीन फीकल स्लज संयंत्र तैयार**

नई दिल्ली: डीआरडीओ के बायो डाइजेस्टर तकनीक पर आधारित पूर्वी दिल्ली नगर निगम ने पांच स्थानों पर फीकल स्लज संयंत्र स्थापित किए जा रहे हैं। इनमें से तीन संयंत्र नंद नगरी, वेलकम, खिचड़ीपुर में बनकर लगभग तैयार है। इन्हें भारत सरकार की आमरुत योजना के अन्तर्गत बनाया गया है। यह फीकल स्लज संयंत्र डीआरडीओ के बायो डाइजेस्टर तकनीक पर आधारित एक नवीन उपचार प्रक्रिया है।

डीआरडीओ के बायो डाइजेस्टर तकनीक पर तीन फीकल स्लज संयंत्र तैयार

जहां ज्यादातर पानी को रि साइकल किया जाता है और ऊर्जा के किसी भी प्रकार के बाहरी स्रोत का प्रयोग नहीं किया जाता है। इस प्रकार के फीकल स्लज संयंत्र से पानी का संरक्षण होगा साथ ही यह प्रक्रिया पूर्ण रूप से जैविक है और इसमें किसी प्रकार के हानिकारक रसायनों का प्रयोग नहीं किया जाता है।

इससे शहर के सीवेज नेटवर्क पर लोड होगा कम

प्रमुख अभियंता विजय प्रकाश ने बताया इस प्रकार फीकल स्लज स्थापित करने से शहर के सीवेज नेटवर्क पर लोड कम होगा क्योंकि इस सिस्टम में सीवेज उसी स्थान पर ट्रीट हो जाएगा। उन्होंने बताया कि सीवेज को ट्रीट करने की प्रक्रिया में जो गैस निकलेगी, उससे बिजली बनाई जाएगी और पानी का रि-साइकल करके उसे फ्लश के लिए प्रयोग किया जाएगा।

विजय प्रकाश ने बताया कि इन फीकल स्लज के क्रियाशील होने पर पूर्वी दिल्ली नगर निगम के पानी और बिजली के बिल में भी कमी आएगी। बेहतर फीकल स्लज व्यवस्था स्वच्छ सर्वेक्षण 2021 के मूल्यांकन मापदंडों में से एक है। इसलिए यह व्यवस्था पूर्वी दिल्ली नगर निगम को बेहतर रैंकिंग प्राप्त करवाने के दिशा में एक महत्वपूर्ण कदम है।

यह प्राकृतिक प्रक्रिया है, जो पर्यावरण के अनुकूल है

प्रमुख अभियंता ने जानकारी देते हुए बताया कि यह एक प्राकृतिक प्रक्रिया है जो पर्यावरण के अनुकूल है। साथ ही इसमें लागत बहुत कम है क्योंकि इसमें पानी के उपचार के लिए मंहगे रसायनों की आवश्यकता नहीं होती है।

उन्होंने बताया कि इसमें केवल एएमआई (एनारोबिक माक्रोबियल इनोकुलम) की आवश्यकता है, जो स्थापना के दौरान जैव.डाइजेस्टर में भरी जाती है। इसे बायो-डाइजेस्टर को सेप्टिक टैंक की तरह आवधिक खाली करने की आवश्यकता नहीं है।

उन्होंने बताया कि बता दें कि जैव-डाइजेस्टर प्रणाली में गैसों का उत्पादन होता है जिसमें 50-65 प्रतिशत मीथेन होता है। शुद्ध मीथेन को एक गुब्बारे में संग्रहीत किया जाता है और उपचार प्रक्रिया में पंप चलाने के लिए बायो-गैस आधारित जनरेटर का उपयोग किया जाता है। पंप केवल पानी को रिसाइकल करने के लिए उपयोग किए जाते हैं। उपचार प्रक्रिया में उपयोग के बाद कुछ अतिरिक्त बचे मीथेन से संयंत्र के लिए बिजली उत्पादन में उपयोग किया जा सकता है।

https://www.bhaskar.com/local/delhi-ncr/news/bio-digester-technology-will-reduce-the-load-on-the-citys-sewage-network-and-can-also-generate-electricity-128291674.html

Defence News

Defence Strategic: National/International

Press Information Bureau
Government of India

Ministry of Defence

Fri, 05 March 2021 4:41PM

Raksha Mantri Confers with Combined Commanders

The Raksha Mantri Hon'ble Rajnath Singh joined the Combined Commanders of the Armed Forces for the Vivechana Sessions at the ongoing Combined Commanders Conference 2021 at Kevadia in Gujarat. Soon after arriving at Kevadia, the RM visited the Statue of Unity to pay his homage to the Iron Man of India, Sardar Vallabh Bhai Patel.

Delivering the inaugural address, the Raksha Mantri dwelled on a wide spectrum of issues affecting the defence & security of the Nation. He spoke at length on the emerging nature of military threats, the critical role of the Armed Forces in meeting these threats and the anticipated changes in the nature of warfare in future. Hon'ble RM expressed his heartfelt appreciation and respect to the selfless courage displayed by the soldiers during the Eastern Ladakh standoff with PLA. Secretaries of Department of Defence, Defence Production, Department of R&D and Financial Advisor Defence Services also shared their thoughts on various relevant aspects with the Combined Commanders.

The two Vivechana sessions held over the day in the presence of the Defence Minister deliberated over a wide range of issues, some of them held behind closed doors. These deliberations addressed the ongoing modernisation of Armed Forces especially focusing on creation of integrated Theatre Commands and infusion of modern technology. Issues like morale &

motivation and promotion of spirit of innovation in the Armed Forces witnessed enthusiastic participation with useful feedback and suggestions from the soldiers and younger officers of the three Services.

https://pib.gov.in/PressReleasePage.aspx?PRID=1702689

पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Fri, 05 March 2021 4:41PM

रक्षामंत्री सशस्त्र सेनाओं के कंबाइंड कमांडर्स कॉन्फ्रेंस में शामिल हुए

रक्षामंत्री माननीय श्री राजनाथ सिंह आज गुजरात के केवडिया में हो रही कंबाइंड कमांडर्स कॉन्फ्रेंस-2021 के सशस्त्र सेनाओं के कंबाइंड कमांडर्स के लिए आयोजित विवेचना सत्रों में शामिल हुए। केवडिया पहुंचने के तुरंत बाद रक्षामंत्री भारत के लौह पुरुष सरदार बल्लभ भाई पटेल को श्रद्धांजलि देने स्टेच्यू ऑफ यूनिटी गए।

कॉन्फ्रेंस में उद्घाटन भाषण देते हुए रक्षामंत्री ने देश की रक्षा और सुरक्षा को प्रभावित करने वाले बहुत से मुद्दों पर चर्चा की। उन्होंने उभरते सैन्य खतरों, इन खतरों से निपटने में सशस्त्र सेनाओं की महत्वपूर्ण भूमिका और भविष्य में संघर्षों की बदलती प्रकृति पर विशद चर्चा की। रक्षामंत्री ने पीएलए के साथ पूर्वी लद्दाख में उत्पन्न गतिरोध के दौरान सैनिकों द्वारा प्रदर्शित निस्वार्थ सेवा और साहस की हृदय से प्रशंसा की और उनके प्रति सम्मान व्यक्त किया। इस अवसर पर रक्षा विभाग, रक्षा उत्पादन विभाग तथा अनुसंधान और विकास विभाग के सचिवों और रक्षा सेवाओं के वित्तीय सलाहकार ने भी विभिन्न संबद्ध विषयों पर अपने विचार व्यक्त किए।

रक्षामंत्री की उपस्थिति में आज दिनभर में दो विवेचना सत्र आयोजित किए गए, जिनमें विभिन्न विषयों पर विचार-विमर्श किया गया और उनमें से कुछ सत्र बंद कमरों में भी हुए। इन सत्रों में सशस्त्र सेनाओं के आधुनिकीकरण खासतौर से समन्वित थिएटर कमांड स्थापित करने और अत्याधुनिक प्रौद्योगिकी को शामिल करने के संबंध में चर्चा हुई। सशस्त्र सेनाओं का मनोबल बढ़ाने और उन्हें प्रेरित करने तथा नवाचार को प्रोत्साहित करने जैसे विषयों पर बहुत उत्साहवर्द्धक भागीदारी देखने को मिली। तीनों सेनाओं के सैनिकों और युवा अधिकारियों की ओर से इस संबंध में बेहद उपयोगी फीडबैक और सुझाव भी सामने आए।

https://pib.gov.in/PressReleasePage.aspx?PRID=1702729

Hindustan Times

Sun, 07 March 2021

Need to develop military into 'future force': PM Modi at top commanders' meet

The PM asked the three services to rid themselves of legacy systems and practices that are no longer relevant

By Rahul Singh

Addressing the country's top military leadership in Kevadia, Gujarat on Saturday, Prime Minister Narendra Modi highlighted the need to develop the Indian military into a "future force" in the backdrop of the swiftly changing technological landscape, break down civil-military silos and expedite decision making, the Prime Minister's Office (PMO) said in a statement.

Speaking on the concluding day of the Combined Commanders' Conference at Kevadia in Gujarat, the PM asked the three services to rid themselves of legacy systems and practices that are no longer relevant. He also appreciated the "resolute dedication" shown by the armed forces over the past year while dealing with the challenging situation on the northern border and also the Covid-19 pandemic.

Prime Minister Narendra Modi visits a stall at an exhibition during the Combined Commanders Conference in Kevadia on Saturday. (ANI)

Issues discussed during the conference included a review of the country's security situation at a time when India's borders with China and Pakistan are in focus, the military's operational readiness, the ongoing theaterisation plans and aspects related to modernisation and indigenisation, officials familiar with the matter said, asking not to be named.

Chief of defence staff (CDS) General Bipin Rawat briefed the PM about the discussions that took place during the three-day conference.

The PM stressed the importance of enhancing indigenisation in the national security system, not just in sourcing equipment and weapons but also in doctrines, procedures and customs, the statement said. The PM also told the top commanders to optimise manpower planning in both military and civilian parts of the national security architecture.

"The Combined Commanders' Conference at Kevadia was a fruitful one. There were extensive deliberations on various strategic subjects. Highlighted the need for making India Aatmanirbhar in the defence sector and reiterated the Government's support for it," the PM tweeted.

The PM's remarks during the top conference are extremely relevant in terms of how the military must develop going forward, said former Northern Army commander Lieutenant General DS Hooda (retd). The focus on technology, rethinking reliance on legacy systems, and indigenisation is absolutely vital, he said.

"The PM's call for a review of civil-military structures is also addressing an area that has hobbled a cohesive national approach to strategic planning. The one area I would be cautious about is the message to indigenise procedures and customs followed by the armed forces. Current military customs and traditions have created a powerful ethos in our military that does not need any unnecessary tinkering," Hooda said.

The conference was held at a time when India and China are negotiating disengagement in eastern Ladakh and the military is putting finishing touches to its theaterisation plan. It also comes on the back of Indian and Pakistani militaries announcing that they had begun observing a ceasefire along the Line of Control from the midnight of February 24.

The scope of the conference was expanded this year to make it “a multi-layered, interactive and informal event”, with the added participation of 30 officers and soldiers of various ranks from the three services. Middle-rung officers, junior commissioned officers (JCOs) and non-commissioned officers (NCOs) took part in the conference for the first time.

The prime minister appreciated the inclusion of the JCOs and the NCOs in this year's conference.

The military’s theaterisation was one of the key topics discussed at the conference, HT has learnt. On the eve of the conference on March 4, chief of defence staff General Bipin Rawat said India’s military leadership will have to more than match the political vision that has mandated the creation of theatre commands. He said service parochialism will have to make way for a combined services outlook to take theaterisation forward.

The Air Defence Command and the Maritime Theatre Command are set to be launched by May. India is expected to have three other integrated commands to secure its western, northern and eastern fronts - these will be rolled out by December 2022. In addition, a logistics command is in the works to avoid duplication of efforts and resources.

The conference was attended by defence minister Rajnath Singh, the CDS, the three service chiefs, secretary-ranked officers from the defence ministry and top military officials.

The conference was traditionally held in Delhi till 2014. In the past, it has been held on India’s solitary aircraft carrier INS Vikramaditya, Indian Military Academy, Dehradun and Air Force Station, Jodhpur.

Noting that the country will be celebrating 75 years of its independence next year, the PM asked the military brass to use the occasion to undertake activities that inspire the country’s youth. He also said “brave veterans” should also be involved in the celebrations.

“Every Indian is very proud of our armed forces. Their courage is remarkable. Urged the armed forces to think about various reforms that would make the forces even stronger. Also discussed ways to integrate brave veterans in the celebrations to mark 75 years of Independence,” the prime minister said in another tweet.

https://www.hindustantimes.com/india-news/need-to-develop-military-into-future-force-pm-modi-101615052575231.html

ThePrint

Sun, 07 March 2021

India's appeasement policy towards China has ended, says former Army Chief Gen Malik

Speaking at ThePrint's Off the Cuff event, in conversation with Editor-in-Chief Shekhar Gupta, Gen Malik also said Modi govt wasn't taking things lying down with adversaries

By Snehesh Alex Philip

New Delhi: India's "appeasement policy" towards China has ended with the Ladakh face-off and the country has been able to send a strong message to Beijing that they can no longer take us for granted, former Army chief Gen V.P. Malik (retd) has said.

Speaking at ThePrint's Off the Cuff programme, in conversation with Editor-in-Chief Shekhar Gupta, the former Army chief, who led India to victory in the Kargil conflict, said Prime Minister Narendra Modi and his team were not taking things lying down, even if there were surprised by China's actions.

Gen Malik, however, called for a probe to determine why India did not deploy additional troops or take precautionary moves even when there were reports of a Chinese troop build-up in Tibet in the months of March and April last year.

Former Army chief Gen. V.P. Malik | Photo: Twitter | @Vedmalik1

Speaking bluntly, the decorated officer also said that it is impossible for India to militarily take back Pakistan Occupied Kashmir and Aksai Chin as of today because of political and diplomatic issues besides the military ones.

"There has been a lot of change in the strategic scenario… 20 years ago, we did not think too much about China because we were following a different policy of both competition plus cooperation and we were spending more time and energy on the cooperation part of it," Gen Malik said. "Twenty years ago, we just fought the Kargil battle and the focus was more on western border."

He said that a lot has changed for China. "Not just in terms of capability but also the kind of leadership that has come up in China. So that has had an effect globally, and particularly in our region," he added.

The former chief said Pakistan seems to have gone down in terms of its capabilities and in terms of its comprehensive national power.

The Chinese threat

Told by Gupta that former Army chief Gen K Sundarji had in the late 1980s said China is our main threat, Gen Malik said the same asymmetry exists between both countries.

"They are much higher than we are. We have not been able to catch up or decrease the gap," he said.

"We have been following a policy of competition-cum-cooperation. The emphasis was more on cooperation than strategic competition," he added. "In fact many often, many of us would even say that it was an appeasement policy. That has changed since the last face-off that we had last year in Eastern Ladakh."

Asked if he was happy with the Pangong Tso disengagement, he said, "I am happy about that. I don't believe both countries want escalation. Both countries don't want to go to war. From that point, it is good development that has taken place".

He quickly added that there is lack of trust and India will have to remain alert and cannot let its guard down.

"The fact is that after the face-off, we have revised our policy. Today there is much greater emphasis on the competition part," he said. "So we are prepared. It is not only at the military level but also the economic level. At the strategic level, we have taken other actions such as the Quad, strategic cooperation with other like-minded parties. That has taken place and is a major revision of our policy."

Modi govt not taking anything lying down

Talking about the current government, the former Army chief said, "The other thing that I have noticed with the present Prime Minister and the set up is that today we are not taking things lying down. Even if we are surprised, whether it was Uri, Pulwama, something on Eastern border, we are now sending a message that we will take action against you."

Explaining further, he said that the Uri attack was followed by surgical strikes and the Pulwama blast was followed by the Balakot strikes.

"It (Balakot) was a very strong message that was sent. What has happened in Wastern Ladakh, I think we have been able to send a strong message to China that please don't take us for granted," he said. "We are not ready to accept any encroachment even in disputed areas. There is a change that has taken place in the last 5-6 years."

Asked how he would rate Modi government's handling of the Ladakh intrusions, he said India has been "able to send a strong message to China, which did not happen earlier".

"So now the Chinese know we are not going to take things for granted and they also know that we will oppose…. Even the kind of posture that we adopted during talks, I think we have been able to send a strong message," he said. "There is a need to maintain that kind of message and posture till both sides agree to de-escalate and pullback. I think the government has handled it well. I do believe this whole government approach, all ministries participating, is what is required. And this is what won us the Kargil and I hope this is followed."

Gen Malik also said that India acted strongly against China in the 1967 Nathu La incident as well as the Sumdorong skirmish.

"We gave a strong message then. Gradually, when things fall into political domain, there is a certain amount of compromise," he said. "Our effort was, let us not carry on with confrontation and competition, let us focus on cooperation hoping it will give peace and tranquility. So that is how things were being done in earlier days and sometimes these strategic people will think we are following a policy of appeasement, more than what was needed."

https://theprint.in/theprint-otc/indias-appeasement-policy-towards-china-has-ended-says-former-army-chief-gen-malik/616879/

ThePrint

Mon, 08 March 2021

Navy, Army and IAF finally agree to procure armed drones from US in $3 bn deal

The Navy, Army, and IAF's decision comes just days before US Secretary of Defense Lloyd Austin's visit to India later this month

By Snehesh Alex Philip

New Delhi: Impressed with the performance of the two leased Sea Guardian drones, the Navy, Army and the Air Force will finally jointly procure 30 armed versions of the American unmanned aerial system in what could be a $3 billion deal, ThePrint has learnt.

The decision comes just before US Secretary of Defense Lloyd Austin's visit to India later this month. Austin's visit could be a precursor to the impending meet of the 'Quad' leaders — US, India, Australia and Japan — which is likely to be held soon.

MQ-9 Reaper or Predator B | www.ga-asi.com

According to sources in the defence and security establishment, initially one of the three services were not on board about procuring the armed predator drones but now all three are finally on the same page.

They added that the Defence Minister Rajnath Singh-led Defence Acquisition Council (DAC) could take a final decision on this "soon".

If approved, this would be the first tri-service procurement since Chief of Defence Staff General Bipin Rawat was appointed to steer the Indian armed forces into a more united force, both in terms of operational doctrine and procurement.

India to procure armed version of Sea Guardian drones

In 2018, the US had offered India the armed version of the Guardian drones, which were originally authorised for sale as unarmed and for surveillance purposed.

India was earlier eyeing both the unarmed Sea Guardian drones for the Navy and the armed Predator B for attack options, but there was a growing feeling that both surveillance and attack could be done by the same drone.

This was because of the prohibitive price involving American drones. The Navy had initially planned for 22 Sea Guardians which were priced at over $2 billion, but then brought down the number to just 12.

However, since all the three services wanted weaponised drones, a decision was taken to jointly pursue the deal.

According to the deal, India will be acquiring 30 MQ-9 Reaper or Predator B, 10 each for the three services.

The MQ-9B has an endurance of 48 hours and a range of over 6,000 nautical miles. It comes with nine hard-points, capable of carrying sensors and laser-guided bombs besides air-to-ground missiles, with a maximum payload of two tonnes.

The Navy, which is the lead agency for procurement of HALE (High Altitude Long Endurance) UAVs, will seek the Acceptance of Necessity (AON) from the DAC.

In November last year, ThePrint had reported that the Navy had inducted two Sea Guardian drones on lease under emergency procurement.

According to sources, the Navy is really impressed with the two UAVs it took on lease from the US firm General Atomics.

Other contracts

This development comes as India pursues 'Project Cheetah', under which a Rs 5,500 crore contract is being taken up to upgrade the 'Heron' medium-altitude long-endurance drone fleet with all three services into an armed one.

The Navy is also pursuing another contract for 10 Naval Shipborne Unmanned Aerial System, for which American firm Boeing is the front runner.

It is also looking at leasing minesweeper vessels and helicopters, as reported in December last year.

In an earlier interview to ThePrint, Rémi Maillard, president of Airbus India and the company's managing director for South Asia, had said that they are in talks with the Navy to lease out Panther helicopters for its warships, as the force looks at bridging the capability gap it faces when it comes to the rotary wing.

https://theprint.in/defence/navy-army-and-iaf-finally-agree-to-procure-armed-drones-from-us-in-3-bn-deal/617406/

THE ECONOMIC TIMES

Sat, 06 March 2021

China hikes defence budget to USD 209 billion, over three times that of India

Synopsis

The hike in defence spending was announced by Chinese Premier Li Keqiang on the opening day of the National People's Congress, China's Parliament, amidst a military standoff with India in eastern Ladakh and growing political and military tensions with the United States.

China on Friday hiked its defence budget for the first time to more than USD 200 billion, over three times higher than that of India, maintaining a single-digit growth for the sixth consecutive year with a 6.8 per cent increase in 2021.

The hike in defence spending was announced by Chinese Premier Li Keqiang on the opening day of the National People's Congress, China's Parliament, amidst a military standoff with India in eastern Ladakh and growing political and military tensions with the United States.

This year's planned defence spending will be about 1.35 trillion yuan (about USD 209 billion), state-run Xinhua news agency reported, adding that the annual defence budget maintains a single-digit growth for a sixth consecutive year.

China's defence budget is about one quarter of the US figure, which is USD 740.5 billion for the 2021 fiscal year, it said.

Beijing plans to spend 1.36 trillion yuan ($210 billion) on defence, which is still less than a third of Washington's military budget.

Friday's increase is over three times higher than India's defence budget of about USD 65.7 billion (including pensions).

Last year, China allocated 1.268 trillion yuan (about USD 196.44 billion), according to the state-run Global Times.

In his 35-page work report outlining China's achievements in 2020 and tasks for 2021, premier Li described last year as a "major success" for the armed forces without mentioning China moving over 60,000 well-armed troops who were mobilised for annual exercises, to contentious areas like Pangong Tso in eastern Ladakh, prompting India to match the People's Liberation Army's (PLA) mobilisation which led to an over eight-month long standoff.

After lengthy rounds of talks, the two sides simultaneously withdrew troops from Pangong Tso area while talks are on for the withdrawal of troops from the rest of the areas.

“Last year, major success was attained in the development of national defence and the armed forces. Our people's forces, with complete competence and fine conduct, safeguarded China's national security and participated in epidemic control,” Li said in his work report.

He also asserted that “absolute leadership” over the two million-strong PLA, the largest in the world, will be vested with the ruling Communist Party of China (CPC) and its “core leader” and President Xi Jinping who heads the all-powerful Central Military Commission (CMC), the overall high command of the PLA.

“This year, we will thoroughly implement Xi Jinping's thinking on strengthening the armed forces and the military strategy for the new era, ensure the Party's absolute leadership over the people's armed forces, and strictly implement the system of ultimate responsibility resting with the chairman of the Central Military Commission.

“We will, bearing in mind the goals set for the centenary of the People's Liberation Army, continue to enhance the political loyalty of the armed forces, strengthen them through reform, science and technology and the training of capable personnel, and run them in accordance with the law,” he said.

Li said to boost military training and preparedness across the board, make overall plans for responding to security risks in all areas and for all situations, and enhance the military's strategic capacity to protect the sovereignty, security and development interests of the country.

“We will improve the layout of defence-related science, technology and industry, and enhance the defence mobilisation system.

“We in government at all levels should vigorously support the development of national defence and the armed forces, and conduct extensive activities to promote mutual support between the civilians and the military, so as to forge an ever-closer bond between the people and the military in the new era,” the premier said.

The increase of the defence budget, amid massive expansion of the military hardware, including building of more aircraft carriers in addition to the two newly-built ones, also comes amidst the increasing tensions between China and the US over Taiwan and the South China Sea (SCS) besides growing discord between the two over Tibet, Xinjiang and Hong Kong.

Last year, a key conclave of the CPC had finalised plans to build a fully modern military on par with the United States by 2027, which is also the centenary year of the PLA.

The PLA this year has also announced a 40 per cent increase in salaries to attract more talent.

China is the second biggest spender of defence after the US.

Defending the increase in defence budget, Zhang Yesui, spokesperson for the NPC, told the media here that China's efforts to strengthen the national defence do not target or threaten any country.

Whether a country poses a threat to others depends on what kind of defence policy it pursues, he said, adding that China is committed to the path of peaceful development and adheres to a defence policy that is defensive in nature.

As the world's second largest economy and the most populous country, China's planned defence spending per capita in 2021 will be less than 1,000 yuan (USD 154), the Xinhua report said.

China applies strict mechanisms of fiscal allocation and budget management on its defence expenditure, which is mainly assigned to personnel, training and sustainment, and equipment, it said.

China has voluntarily downsized its armed forces by over four million troops since 1978, according to a white paper released in 2019.

https://economictimes.indiatimes.com/news/defence/china-military-budget-to-grow-6-8-in-2021/articleshow/81342267.cms

Mon, 08 March 2021

ISRO to launch Geo imaging satellite on March 28

GISAT-1 is slated to be lofted into space by GSLV-F10 rocket from Sriharikota spaceport in Andhra Pradesh's Nellore district

Edited By Saurabh Sinha

Highlights

1. ***ISRO is planning to launch an earth observation satellite on March 28***
2. ***GISAT-1 is slated to be lofted into space by GSLV-F10 rocket from Sriharikota***
3. ***The satellite would provide near real-time imaging of a large area***

Bengaluru: India plans to launch on March 28 an earth observation satellite that will provide it near real-time images of its borders and also enable quick monitoring of natural disasters.

GISAT-1 is slated to be lofted into space by GSLV-F10 rocket from Sriharikota spaceport in Andhra Pradesh's Nellore district, about 100 kms north of Chennai.

"We are looking to launch this Geo imaging satellite on March 28, subject to weather conditions", an official of the Bengaluru-headquartered Indian Space Research Organisation (ISRO) told PTI on Sunday.

The rocket will place the spacecraft in a geosynchronous orbit. It will be subsequently positioned in geostationary orbit, about 36,000 kms above earth's equator, using its onboard propulsion system.

Representational image (Credit: Pixabay)

The launch of GISAT-1 onboard GSLV-F10 rocket was originally planned for March 5 last year but postponed a day before the blast-off due to technical reasons.

Experts said positioning the state-of-the-art agile earth observation satellite in geostationary orbit has key advantages. "It's going to be a game-changer in some sense for India", a Department of Space official said.

"With onboard high resolution cameras, the satellite will allow the country to monitor the Indian land mass and the oceans, particularly its borders continuously".

Listing the objectives of the mission, ISRO has earlier said the satellite would provide near real-time imaging of the large area region of interest at frequent intervals.

It would help in quick monitoring of natural disasters, episodic and any short-term events.

The third objective is to obtain spectral signatures of agriculture, forestry, mineralogy, disaster warning, cloud properties, snow and glacier and oceanography.

GISAT-1 will facilitate near real-time observation of the Indian sub-continent, under cloud-free condition, at frequent intervals, ISRO said.

The planned launch of GISAT-1, weighing about 2,268 kg, comes close on the heels of the successful February 28 PSLV- C51 mission that orbited Brazil's earth observation satellite Amazonia-1 and 18 co-passengers, including five built by students.

Secretary in the Department of Space and ISRO Chairman K Sivan told PTI last week that the technical issues that led to postponement of GISAT-1 mission have been resolved and the further delay in the launch was due to COVID-19-induced lockdown which affected normal work.

According to sources, GISAT-1 will be followed by the maiden flight of Small Satellite Launch Vehicle, ISRO's compact launcher, likely in April. SSLV has been designed to meet "launch on demand" requirements in a cost-effective manner for small satellites in a dedicated and ride-share mode. It is a three-stage all solid vehicle with a capability to launch up to 500 kg satellite mass into 500 km low earth orbit (LEO) and 300 kg into Sun Synchronous Orbit (SSO).

By comparison, PSLV -- the workhorse launch vehicle of ISRO -- can take up to 1,750 kg payload into SSO of 600 km altitude.

With lower per kg launch cost, the mini launcher will have multiple satellite mounting options for nano, micro and small satellites.

Sivan had earlier termed the SSLV an innovative vehicle which can be assembled in just 72 hours. "Instead of 60 days (for building a PSLV), it (SSLV) will be assembled in three days; instead of 600 people (needed to build a PSLV), it (SSLV) will be done by six people", he had said.

https://zeenews.india.com/india/isro-to-launch-geo-imaging-satellite-on-march-28-2346314.html

जागरण

Mon, 08 March 2021

अब आसमान से होगी दुश्मन की हर एक गतिविधि पर नजर, 28 मार्च को लॉन्च होगा जियो इमेजिंग उपग्रह

भारत सरकार 28 मार्च को एक धरती पर नजर रखने के लिए एक अवलोकन उपग्रह का प्रक्षेपण करना चाहती है। यह उपग्रह देश की सीमाओं की रियल टाइम तस्वीरों को उपलब्ध कराएगा। इससे प्राकृतिक आपदाओं की त्वरित निगरानी भी की जा सकेगी।

By Krishna Bihari Singh

बेंगलुरू: भारत सरकार 28 मार्च को एक धरती पर नजर रखने के लिए एक अवलोकन उपग्रह का प्रक्षेपण करना चाहती है। यह उपग्रह देश की सीमाओं की रियल टाइम तस्वीरों को उपलब्ध कराएगा। समाचार एजेंसी पीटीआइ की रिपोर्ट के मुताबिक इससे प्राकृतिक आपदाओं की त्वरित निगरानी भी की जा सकेगी। इस उपग्रह को जीसैट-**1** (GISAT-1) नाम दिया गया है जिसे आंध्र प्रदेश के नेल्लोर जिले में श्रीहरिकोटा अंतरिक्ष केंद्र से जीएसएलवी-एफ 10 (GSLV-F10 rocket) के जरिए प्रक्षेपित किया जाएगा।

इसरो (Indian Space Research Organisation, ISRO) के एक अधिकारी ने रविवार को बताया कि भारतीय अंतरिक्ष अनुसंधान संगठन 28 मार्च को इस जियो इमेजिंग उपग्रह (Geo imaging satellite) को प्रक्षेपित करना चाहते हैं। हालांकि इसका 28 मार्च को प्रक्षेपण मौसम की स्थितियों पर भी निर्भर करेगा। इस उपग्रह (GISAT-1) को 36 हजार किलोमीटर की ऊंचाई वाली कक्षा में स्थापित किया जाएगा।

समाचार एजेंसी पीटीआइ ने अपनी रिपोर्ट में कहा है कि इस उपग्रह का प्रक्षेपण तो पिछले साल पांच मार्च में ही होने वाला था लेकिन इसे तकनीकी कारणों के चलते स्थगित कर दिया गया। अंतरिक्ष विभाग के एक अधिकारी ने कहा कि जीएसएलवी-एफ 10 के जरिये जीसैट-**1** का प्रक्षेपण भारत के लिए कई मायनों में बेहद महत्वपूर्ण साबित होने जा रहा है। अधिकारी ने बताया कि यह उपग्रह हाई रेजोलूशन के कैमरों से लैस होगा जिनकी मदद से भारतीय सीमाओं और महासागरों पर नजर रखी जा सकेगी... यही नहीं प्राकृतिक आपदाओं के दौरान भी इससे काफी मदद मिलेगी। इसकी मदद से किसी भी प्राकृतिक आपदा

की त्वरित निगरानी की जा सकेगी। इसरो के मुताबिक उपग्रह जीसैट-1 एक अत्याधुनिक पर्यवेक्षण उपग्रह है जिसका वजन 2,268 किलोग्राम है।

इसरो प्रमुख के सिवन का कहना है कि जिन तकनीकी समस्याओं के चलते जीसैट-1 मिशन को स्थगित कर दिया था उसका समाधान हो गया है। कोरोना संकट और लॉकडाउन के कारण भी इसके प्रक्षेपण में देरी हुई। मालूम हो कि इसरो ने 28 फरवरी को अपनी कॉमर्शियल ईकाई 'न्यू स्पेस इंडिया लिमिटेड' के पहले मिशन के तहत बीते रविवार को ब्राजील के अमेजोनिया-1 समेत 18 अन्य उपग्रहों का सफल प्रक्षेपण किया था।

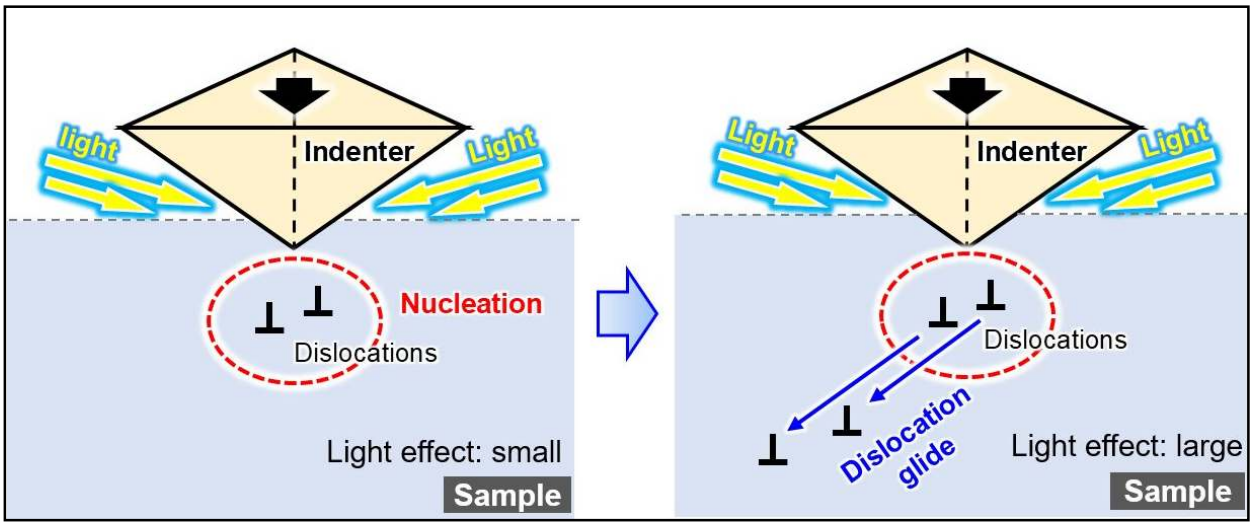
https://www.jagran.com/news/national-isro-satellite-set-for-mar-28-launch-will-help-india-keep-an-eye-on-borders-near-real-time-21438414.html

PHYS.ORG

Sat, 06 March 2021

Light in concert with force reveals how materials become harder when illuminated

Semiconductor materials play an indispensable role in our modern information-oriented society. For reliable performance of semiconductor devices, these materials need to have superior mechanical properties: they must be strong as well as resistant to fracture, despite being rich in nanoscale structures.



Schematic illustration of how light affects the nucleation (birth) of dislocations (slippages of crystal planes) and dislocation motion, when the sample is also placed under mechanical loading. The Nagoya University/Technical University of Darmstadt research collaboration has found clear evidence that propagation of dislocations in semiconductors is suppressed by light. The likely cause is interaction between dislocations and electrons and holes excited by the light. Credit: Atsutomo Nakamura

Recently, it has become increasingly clear that the optical environment affects the structural strength of semiconductor materials. The effect can be much more significant than expected, especially in light-sensitive semiconductors, and particularly since due to technological constraints or fabrication cost many semiconductors can only be mass-produced in very small and thin sizes. Moreover, laboratory testing of their strength has generally been performed on large samples. In the light of the recent explosion in emerging nanoscale applications, all of this suggests that there is an urgent need for the strength of semiconductor materials to be reappraised under controlled illumination conditions and thin sample sizes.

To this end, Professor Atsutomo Nakamura's group at Nagoya University, Japan, and Dr. Xufei Fang's group at the Technical University of Darmstadt have developed a technique for quantitatively studying the effect of light on nanoscale mechanical properties of thin wafers of semiconductors or any other crystalline material. They call it a 'photoindentation' method. Essentially, a tiny, pointy probe indents the material while it is illuminated by light under controlled conditions, and the depth and rate at which the probe indents the surface can be measured. The probe creates dislocations—slippages of crystal planes—near the surface, and using a transmission electron microscope the researchers observe the effect of light at a range of wavelengths on dislocation nucleation (the birth of new dislocations) and dislocation mobility (the dislocations' gliding or sliding away from the point where they were created). The nucleation and mobility are measured separately for the first time and is one of the novelties of the photoindentation technique.

The researchers have discovered that while light has a marginal effect on the generation of dislocations under mechanical loading, it has a much stronger effect on the motion of dislocations. When a dislocation occurs, it is energetically favorable for it to expand and join up (nucleate) with others, and the imperfection gets bigger. Illumination by light does not affect this: the electrons and holes excited in the semiconductor by the light (the photo-excited carriers) do not affect the strain energy of the dislocation, and it is this energy that determines the "line tension" of the dislocation that controls the nucleation process.

On the other hand, dislocations can also move in a so-called 'glide motion', during which photo-excited carriers are dragged by dislocations via electrostatic interaction. The effect of photo-excited carriers on this dislocation motion is much more pronounced: if enough carriers are produced, the material becomes much stronger.

This effect is strikingly demonstrated when the same experiment is carried out in complete darkness and then under illumination with light at a wavelength that matches the semiconductor band gap (which produces an increased number of photo-excited carriers). When indented, any solid material initially undergoes "plastic deformation"—changing shape without springing back, somewhat like putty—until the load becomes too great, upon which it cracks. The Nagoya University research group demonstrated that the inorganic semiconductor zinc sulfide (ZnS) in total darkness behaves somewhat like putty, deforming by a huge 45% under shear strain without cracking or falling apart. However, when illuminated at the correct wavelength, it becomes quite hard. At other wavelengths it becomes not quite as hard.

The new findings demonstrate that purely plastic deformation without crack formation in semiconductor materials occurs at the nanoscale. With regards to mechanical behavior, these semiconductors therefore resemble metallic materials. This newly established, robust experimental protocol makes it possible to evaluate the effect of light on the strength of even non-semiconducting materials that are very thin. Professor Nakamura notes: "One particularly important aspect is that non-semiconductors can exhibit semiconducting properties near the surface, due to oxidation, for instance, and since the starting point of deformation or fracture is often the surface, it is of great significance to establish a method for accurately measuring the strength of materials under controlled illumination conditions at the very surface, on a nanoscale."

The hardening effect that electron-hole pairs freed by light illumination have on material strength—by suppressing the propagation of dislocations, particularly near the surface—is part of a paradigm shift in the science of material strength. Conventionally, when considering the strength of a material, the atomic arrangement was the smallest unit. In other words, there was a premise that the strength of the material could be understood from the atomic arrangement and elasticity theory. However, recent studies have reported that the strength characteristics of materials change significantly due to external influences such as light and an electric field. Therefore, Professor Nakamura notes, "it is becoming more and more accepted that other viewpoints must be added to the theory of material strength which include the motion of electrons and holes that are smaller than atoms."

"This study reaffirms the quantum-level effect on the strength of such materials. In this respect, it can be said that this research has achieved one milestone in the paradigm shift in the field of material strength that is currently occurring." Dr. Xufei Fang adds: "Now that the creation of devices on the true nanoscale is becoming a reality, the impact of light on the structural strength of various inorganic semiconductors is an issue to be considered."

More information: Atsutomo Nakamura et al, Photoindentation: A New Route to Understanding Dislocation Behavior in Light, *Nano Letters* (2021). DOI: 10.1021/acs.nanolett.0c04337

Journal information: *Nano Letters*

https://phys.org/news/2021-03-concert-reveals-materials-harder-illuminated.html

PHYS.ORG

Sat, 06 March 2021

Researchers propose novel dichroic laser mirror design with mixture layers and sandwich-like-structure interfaces

By Zhang Nannan

Recently, a research team from the Shanghai Institute of Optics and Fine Mechanics of the Chinese Academy of Sciences (CAS) proposed a new design with mixture layers and novel sandwich-like-structure interfaces to meet the challenging requirements of the ideal dichroic laser mirrors. The research article was published in *Photonics Research* on Jan. 27, 2021, and was highlighted as an Editor's Pick.

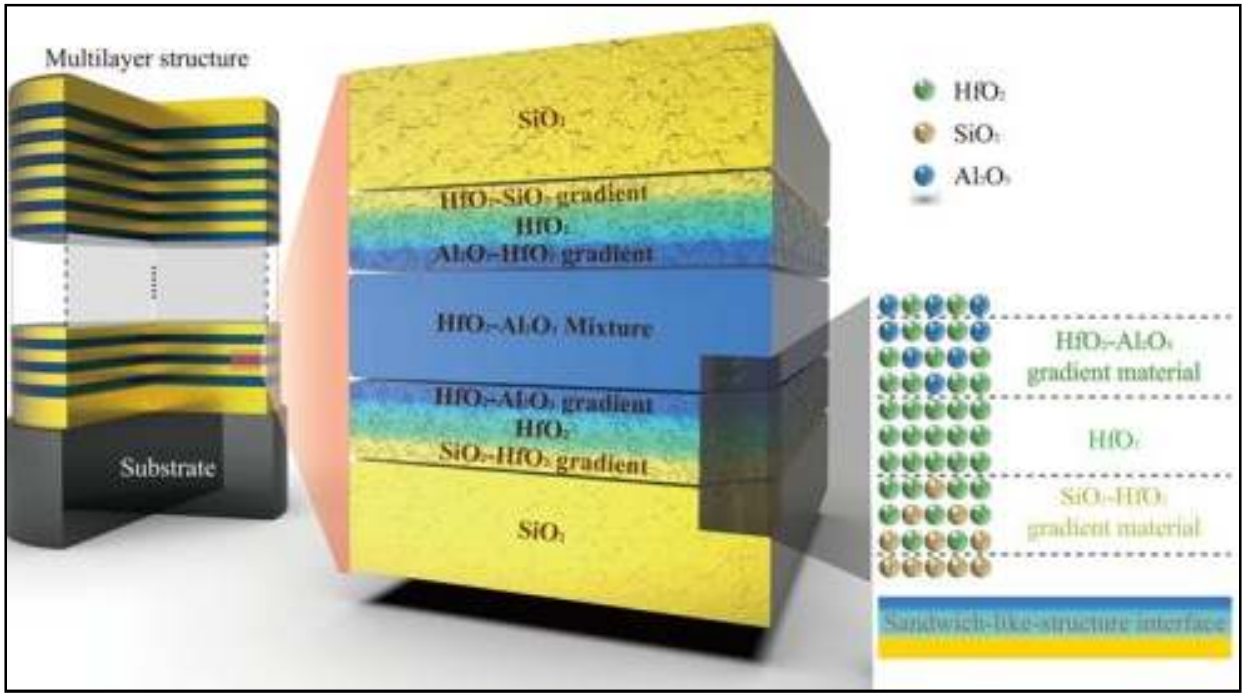


Fig. 1. Schematic diagram of the proposed MDLM design. Credit: SIOM

Dichroic laser mirrors are usually used as harmonic separators, beam combiners or splitters. They play an important role in many laser applications, including inertial confinement fusion laser, petawatt femtosecond laser, high power fiber lasers, compact Q-switched or mode-locked lasers, and other emerging lasers. The requirements for dichroic laser mirrors continue to increase with the development of laser technology. The ideal dichroic laser mirror for high power lasers requires a

significantly different reflection or transmission property and a high laser-induced damage threshold (LIDT) at two different wavelengths of interest simultaneously.

Unfortunately, traditional dichroic laser mirrors (TDLM) composed of alternating high- and low-refractive-index (n) pure materials often have difficulty in achieving excellent spectral performance and high LIDTs at two wavelengths simultaneously. There is a trade-off between the required optical performance and LIDT.

In this work, the researchers designed and prepared a mixture-based dichroic laser mirror (MDLM), which uses HfO_2-Al_2O_3 mixture material as a high-n layer with adjustable n and optical bandgap, and pure SiO2 as a low-n material. The interface between the low-n SiO_2 layer and the high-n HfO_2-Al_2O_3 mixture layer is a sandwich-like-structure interface ("SiO_2-HfO_2 gradient material | HfO_2 | HfO_2-Al_2O_3 gradient material"), which replace the traditional discrete interface.

The MDLM shows excellent spectral performance and improved performance over TDLM with finer mechanical property, lower absorption, and higher LIDT. For both the s-polarized 7.7-ns pulses at a wavelength of 532 nm and the p-polarized 12-ns pulses at a wavelength of 1,064 nm, the LIDTs are almost doubled.

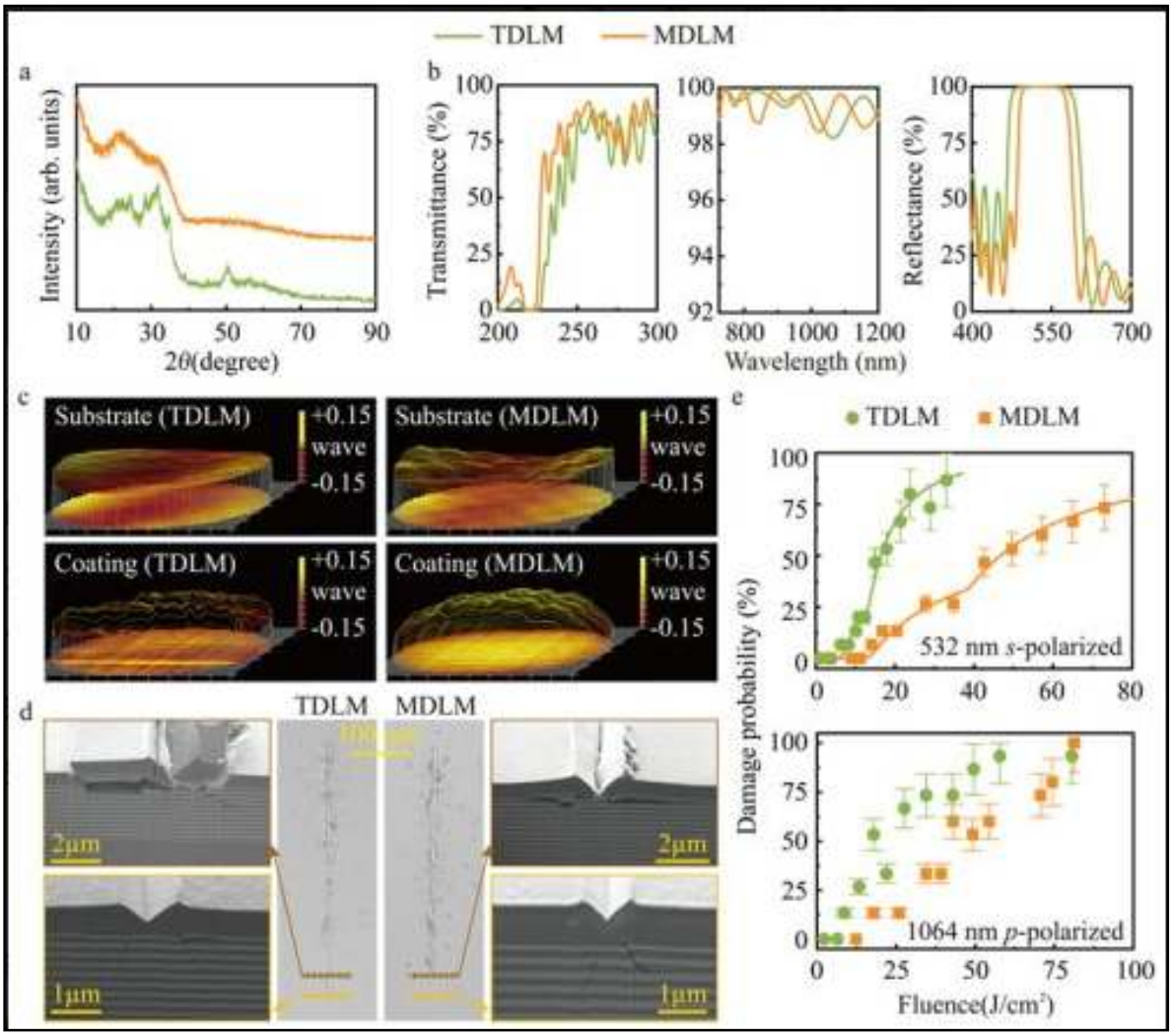


Fig. 2. Microstructure and optical property of the TDLM and MDLM coatings. Credit: SIOM

This MDLM design strategy opens new avenues for improved dichroic mirror coatings and other laser coatings and can benefit many areas of laser technology that rely on high-quality laser coatings.

More information: Tingting Zeng et al. Dichroic laser mirrors with mixture layers and sandwich-like-structure interfaces, *Photonics Research* (2020). DOI: 10.1364/PRJ.411372

https://phys.org/news/2021-03-dichroic-laser-mirror-mixture-layers.html

PHYS.ORG

Sat, 06 March 2021

Nanoprinted high-neuron-density optical linear perceptrons perform near-infrared inference on a CMOS chip

Today, machine learning permeates everyday life, with millions of users every day unlocking their phones through facial recognition or passing through AI-enabled automated security checks at airports and train stations. These tasks are possible thanks to sensors that collect optical information and feed it to a neural network in a computer.

Credit: CC0 Public Domain

Scientists in China have presented a new nanoscale AI optical circuit trained to perform unpowered all-optical inference at the speed of light for enhanced authentication solutions. Combining smart optical devices with imaging sensors, the system performs complex functions easily, achieving a neural density equal to 1/400th that of the human brain and a computational power more than 10 orders of magnitude higher than electronic processors.

Imagine empowering the sensors in everyday devices to perform artificial intelligence functions without a computer—as simply as putting glasses on them. The integrated holographic perceptrons developed by the research team at University of Shanghai for Science and Technology led by Professor Min Gu, a foreign member of the Chinese Academy of Engineering, can make that a reality. In the future, its neural density is expected to be 10 times that of human brain.

How it works

Traditionally, visual information is translated into electronic information, which is then processed by energy-hungry hardware. The technology Professor Gu's team developed skips this translation step and processes the optical information directly and without using any power.

Elena Goi, the first author of the published paper and a key member of Prof Gu's team, said that the processing of optical information is enabled by state-of-the-art nanofabrication.

"By employing high-precision 3-D nanofabrication technology, we are able to add AI optical elements to industry-standard imaging sensors. This is comparable to putting tailored, task-specific smart glasses on the imaging sensors, which process the incoming optical information before it is even detected."

Impact

Using a state-of-the-art laser 3-D-nanoprinting technology, the researchers fabricated optical perceptrons with a neuron density of over 500 million neurons per square centimeter. The nanoscale feature size of these smart optical elements pushes the upper limit for the computational power for the nanoprinted decryptors lies at 400 ExaFLOPS (10^{18} FLOPS, floating operations per second), an increase in the operations per second of five orders of magnitude compared with integrated photonic hardware.

By printing the perceptrons directly on CMOS imaging chips, Goi said, it is possible to realize AI optical circuits, which not only outperform current optical methods, but show the potential for application in a wide range of fields from security check, medical diagnostics, automatic driving, satellite image processing, etc.

According to Professor Gu, this technology will enable a whole new family of energy-efficient, AI-enabled edge devices for processing optical information. This is of particular importance for applications where energy consumption is critical or data connectivity is limited, for example, smart sensing devices in remote areas or smart sensors for long-term deployment.

More information: Elena Goi et al, Nanoprinted high-neuron-density optical linear perceptrons performing near-infrared inference on a CMOS chip, *Light: Science & Applications* (2021). DOI: 10.1038/s41377-021-00483-z

Journal information: *Light: Science & Applications*

https://phys.org/news/2021-03-nanoprinted-high-neuron-density-optical-linear-perceptrons.html

COVID-19 Research News

The Indian EXPRESS

Sun, 07 March 2021

Research: Covid-19 antibodies, vaccines may be less effective against new variants

With few exceptions, researchers found more antibody is needed to neutralise the new variants — whether the antibodies were produced in response to vaccination or natural infection

New Delhi: New research indicates that three new, fast-spreading variants of the novel coronavirus (from South Africa, the UK and Brazil) can evade antibodies that work against the original form of the virus that sparked the pandemic. With few exceptions, the researchers found more antibody is needed to neutralise the new variants — whether the antibodies were produced in response to vaccination or natural infection, or were purified antibodies intended for use as drugs.

The study, from laboratory-based experiments, were published in Nature Medicine on Thursday. According to the researchers, the findings suggest that Covid-19 drugs and vaccines developed thus far may become less effective as the new variants become dominant.

The virus SARS-CoV-2 uses its spike protein to latch onto and get inside cells. The spike thus became the prime target for drug and vaccine developers. Then, this winter, fast-spreading variants emerged; all carry multiple mutations in their spike genes, which could lessen the effectiveness of spike-targeted drugs and vaccines now being used.

A batch of syringes filled with Covid-19 vaccines are ready for inoculations in Pomona, Calif., Friday, March 5, 2021. (AP Photo: Damian Dovarganes, File)

In the lab, researchers tested the ability of antibodies to neutralise the three virus variants. They tested the variants against antibodies in the blood of people who had recovered from SARS-CoV-2 infection or were vaccinated with the Pfizer vaccine. They also tested antibodies in the blood of mice, hamsters and monkeys that had been vaccinated with an experimental Covid-19 vaccine, developed at Washington University School of Medicine. The University said in a press statement

that the UK variant could be neutralised with similar levels of antibodies as needed to neutralise the original virus, but the other two variants required from 3.5 to 10 times as much antibody.

Senior author Michael S Diamond was quoted as saying: “We’re concerned that people whom we’d expect to have a protective level of antibodies because they have had Covid-19 or been vaccinated against it, might not be protected against the new variants. There’s wide variation in how much antibody a person produces in response to vaccination or natural infection. Some people produce very high levels, and they would still likely be protected against the new, worrisome variants. But some people, especially older and immunocompromised people, may not make such high levels of antibodies. If the level of antibody needed for protection goes up tenfold, as our data indicate it, they may not have enough…”

https://indianexpress.com/article/explained/new-findings-suggest-covid-antibodies-vaccines-may-be-less-effective-against-variants-7216233/