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Newspapers Clippings

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FINANCIAL EXPRESS
Read to Lead

Tue, 19 Oct 2021

China tests hypersonic glide vehicle: know more about it

This hypersonic glide vehicle before cruising down towards its target had flown through low-orbit space and the hypersonic speed is five times the speed of sound

Amidst continued efforts being made by China to expand its presence in the region and its increased tension with Taiwan, its military earlier this year had launched a rocket that carried a hypersonic glide vehicle. This hypersonic glide vehicle before cruising down towards its target had flown through low-orbit space and the hypersonic speed is five times the speed of sound.

File photo of a missile being fired during a military drill. (AP)

The test was carried out in August by China and the US intelligence was caught by surprise, according to a report in the London-based Financial Times on Saturday.

The FT reports which cites various sources reads, "During the test, the missile missed its target by about two-dozen miles, according to three people briefed on the intelligence."

Adding, "Two others have said that the test showed that China had made astounding progress on hypersonic weapons and was far more advanced than US officials realized. And the test has raised new questions about why the US often underestimated China's military modernization."

According to the FT report which is citing a security official and security expert of that country has stated that the weapon was being developed by the China Academy of Aerospace Aerodynamics (CAAA). This was being done under the state-owned China Aerospace Science and Technology Corporation, which is responsible for making missile systems and rockets for China's space programme. The sources cited had been quoted as saying that the vehicle was launched on a Long March rocket. The Long March rocket is used for the space programme.

So what can this glide vehicle do?

In theory the vehicle can fly over the South Pole. And, this could be a huge challenge for the US military as its missile defence systems are focused on the North Pole, according to the FT report.

China Academy of Launch Vehicle Technology had on its official social media platform announced in July this year that a Long March 2C rocket was launched and it was its 77th launch. And this was followed by another announcement on its social media on August 24, about the 79th flight. What was surprising that there was no announcement about the 78th launch?

Which are the other countries which are developing such weapons?

According to the FT report, the US, Russia and now China are developing hypersonic weapons. And this includes glide vehicles which are launched into space on a rocket, and they orbit the earth on their own momentum.

According to a report in the US based military news portal BreakingDefense.Com in about a year from now, the US Army is soon going to deliver its first operational rounds of its Long-Range Hypersonic Weapon to a unit. The report states that the Long-Range Hypersonic Weapon is a major part of the US Army's Long-Range Precision Fires effort, a critical modernization priority because it pivots to the dispersed Indo-Pacific. The news portal had also earlier reported that the LRHW can fly further than 2,775 km, or about 1,725 miles.

What about India?

In 2020, the Indian Defence Research and Development Organisation (DRDO) had test fired the Hypersonic Technology Demonstration Vehicle (HSTDV) from the Abdul Kalam Island off the coast of Odisha.

The scramjet technology used in hypersonic vehicles is not only complex but very expensive too.

According to experts, several more tests will need to be carried out before a credible scramjet powered hypersonic delivery system can be built. What was tested last year by India was a scramjet-powered HSTDV with a speed of Mach 6. It was a 22 second flight and it was at an altitude of 30 kms. And in the 22 seconds flight it covered 40 kms.

What does it mean for India?

With the neighbouring China now getting more aggressive in building its military and nuclear capabilities, for India it is a matter of concern. These capabilities highlight the threat to India's space assets as well as assets based on the land.

In 2020, DRDO had also inaugurated an advanced Hypersonic Wind Tunnel (HWT) test facility in Hyderabad. This is an enclosed free jet facility and is pressure vacuum driven and simulated Mach 5 to 12.

https://www.financialexpress.com/defence/china-tests-hypersonic-glide-vehicle-know-more-about-it/2351675/

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Tue, 19 Oct 2021

What is Hypersonic Missile: चीन के इस हथियार से दुनिया है बैचैन, क्या भारत के पास है काट?

चीन ने हाल ही हाइपरसोनिक ग्लाइड मिसाइल का परीक्षण कर अमेरिका सहित पूरी दुनिया को हैरत में डाल दिया है। रिपोर्ट के मुताबिक चीन की यह मिसाइल परमाणु हथियार (nuclear-capable hypersonic missile) ले जाने में सक्षम है। क्या भारत के पास चीन की इस तकनीकी बढ़त (does india has hypersonic missile) का कोई विकल्प है।

प्रतीकात्मक तस्वीर

अखबार फाइनेंशियल टाइम्स की एक रिपोर्ट के मुताबिक चीन ने अगस्त माह में यह परीक्षण किया। इस दौरान मिसाइल धरती का चक्कर काटते हुए अपने लक्ष्य के करीब पहुंची। हालांकि रिपोर्ट में यह स्पष्ट नहीं किया गया है कि यह मिसाइल परीक्षण था या फिर हाइपरसोनिक ग्लाइड व्हीकल था। लेकिन यह धरती के निचले कक्ष को पार करते हुए लक्ष्य के करीब पहुंची। यह लक्ष्य को भेदने में कामयाब नहीं हुई, लेकिन यह लक्ष्य के करीब कुछ ही किलोमीटर की दूरी पर गिरी।

चीन के इस परीक्षण से दुनिया में हथियारों की एक नई होड़ शुरू होने की आशंका है। वैसे तो अमेरिका और रूस दोनों देशों ने भी हाइपरसोनिक ग्लाइड मिसाइलें विकसित करने की बात कही है। चीन के इस परीक्षण से सबसे ज्यादा चिंतित अमेरिका है। कहा जा रहा है कि चीन का यह हथियार दक्षिणी ध्रुव के ऊपर से उड़ सकता है, जो अमेरिका के लिए एक बड़ी चुनौती है।

यह भी कहा जा रहा है कि चीन ने यह गोपनीय परीक्षण चाइना एकेडमी ऑफ लॉन्च व्हीकल टेक्नोलॉजी से किया। वैसे चीन की सरकार ने किसी भी मिसाइल परीक्षण से इनकार किया है। उसका कहना है कि उसने हाइपरसोनिक व्हीकल का परीक्षण किया है। यह एक रूटीन टेस्ट है।

क्या होती है हाइपरसोनिक मिसाइल (What is hypersonic glide missile)

हाइपरसोनिक मिसाइल एक ऐसा व्हीकल होता है जो ध्वनि की गति से पांच गुना तेजी से कहीं भी वार कर सकता है। ध्वनि की गति को मैक में मापा जाता है। यह मिसाइल मैक-5 की गति को पार कर सकती है। अगर इसको किलोमीटर में बदलें तो इसकी स्पीड 6,115 किमी प्रति घंटे से अधिक होगी।

वैसे चीन के इस परीक्षण से काफी पहले अमेरिका ने हाइपरसोनिक स्पीड हासिल कर ली थी। 1967 में अमेरिकी एयरफोर्स और नासा के पायलट विलियम जे नाइट ने मैक 6.72 यानी 4520 माइल प्रति घंटे की स्पीड से नॉर्थ अमेरिकन एक्स-15 को उड़ाया था। इसके बाद वर्ष 2004 में नासा के एक्स-43ए ने मैक 9.6 यानी 7,310 माइल प्रति घंटे की स्पीड हासिल की थी।

क्या होती है सुपरसोनिक मिसाइल (what is supersonic missile)

एक सुपरसोनिक मिसाइल मैक-1 से मैक-3 के बीच की स्पीड से लक्ष्य को भेदती है। किलोमीटर में समझें तो इस तरह की मिसाइलें अधिकतम 2300 किमी की रफ्तार से वार करती हैं। भारत और रूस के

संयुक्त प्रयास के तहत विकसित ब्रह्मोस मिसाइल सुपरसोनिक मिसाइल का सबसे कारगर नमूना है। यह मिसाइल करीब 2100 से 2300 किमी प्रति घंटे की रफ्तार से वार करती है।

हाइपरसोनिक मिसाइल विकसित करने में कहां खड़ा है भारत

भारत और चीन के बीच तनावपूर्ण रिश्ते को देखते हुए पड़ोसी देश द्वारा विकसित हाइपरसोनिक मिसाइल की बात चिंता पैदा करने वाली है। लेकिन इसको लेकर बहुत परेशान होने की जरूरत नहीं है। हमारे वैज्ञानिक भी हाइपरसोनिक टेक्नोलॉजी हासिल कर चुके हैं। रक्षा शोध और विकास संगठन (डीआरडीओ) सफलतापूर्वक हाइपरसोनिक टेक्नोलॉजी डिमोंस्ट्रेटर व्हीकल का परीक्षण कर चुके हैं। इस तकनीक से 20 सेकंड में मैक 6 की स्पीड से 32.5 किमी की ऊंचाई से उड़ान भरा जा सकता है।

https://hindi.news18.com/news/knowledge/explained-what-is-hypersonic-glide-missile-that-china-tested-difference-between-hypersonic-and-supersonic-missile-does-india-has-hypersonic-missile-santosh-3803589.html

Tue, 19 Oct 2021

DRDO awards student Rs 3 lakh for innovation that reduces casualties in accidents

A 21-year-old engineering student from Tamil Nadu, Pravin Nagendran has developed a plant-based material that can save lives in car and aircraft accidents. His innovation won third place and Rs 3 Lakh in DRDO's 'Dare to Dream' contest.

By Roshini Muthukumar, Edited by Divya Sethu

From deadly crashes to runway mishaps, aircraft accidents are inevitable. In 2019, India saw over 280 deaths caused by aircraft accidents.

To minimise this damage, aircraft and other vehicles are built using a composite material like glass fibre to add tensile strength. However, these materials are flammable.

To reduce the chances of the vehicle catching fire owing to the material, Pravin Nagendran (21), a third-year Biotechnology student of Bannari Amman Engineering College, Erode began working on a plant-based alternative.

"Materials like glass fibre are made from epoxy resin which contains petroleum. This makes it highly flammable. But a plant-based epoxy resin would not only be cost-effective but also safer. Besides being used as a material for building aircrafts, it can also be used in other vehicles to prevent the risk of fire," says Pravin, in an interview with The Better India.

A flame-resistant material

In 2019, Pravin started working on the project and began thinking of alternative elements to make composite materials. With help from his faculty members Kirupa Sankar, A Vimmalarasan, and Ravi Kumar, he spent one year identifying various biomaterials.

"After one year of research, we finalised a specific plant whose name we cannot mention," says Pravin, adding that he had to put his project on hold for a few months owing to the COVID-19 lockdowns.

However, once he had access to his college's laboratory, he began working on a prototype. He finalised the material within three months with help from four of his friends.

"It was made by extracting nanoparticles from the ash of the plant. This was incorporated with natural fibre composite to make a flame-resistant material. A plant-based extract was used even for binding," says Pravin.

To test its resistance to fire, the material was heated at high temperatures. Pravin says the results showed that it was 100% resistant to fire and stayed intact. Since the material is extracted from a plant, Pravin says it is biodegradable and environment-friendly as well.

He submitted his project to the Defense Research and Development Organisation's contest, Dare to Dream 2.0. After passing three rounds, Pravin's project won third place among 65,000 participants and he received prize money of Rs 3 lakh.

"Now, I am working on developing the material further to improve its tensile strength. I hope to commercialise it after I am done with college and launch a startup," says Pravin.

https://www.thebetterindia.com/264089/drdo-dare-to-dream-contest-winner-innovation-aircraft-accident-biodegradable/

ThePrint

Tue, 19 Oct 2021

Eye on mega deal with Navy, Dassault will fly Rafale Marine to India in 2022 for showcase trip

Dassault Aviation had been in talks with Navy for the naval version of Rafale even before the French giant signed the contract for 36 air force fighters in 2016

By Snehesh Alex Philip

New Delhi: French defence giant Dassault Aviation is likely to bring the naval version of the Rafale aircraft to India in early 2022 to showcase its ability to carry out a ski-jump, which is a crucial take-off capability to operate from Indian aircraft carriers, ThePrint has learnt.

Sources in the defence establishment said Dassault, which is eyeing a mega contract with the Indian Navy for new fighters, has offered to bring the Rafale M (Marine) to India. The Navy plans to procure new fighters to replace the Russian MiG 29Ks.

"The Rafale M will not take off from the aircraft carrier (during the showcase) but from the shore-based test facility (SBTF) at INS Hansa, Goa. The Dassault Aviation is confident and wanted to showcase their capability in India itself," a source said.

The sources added that the dates are yet to be worked out but Dassault has offered to bring the Rafale M as early as January, if needed.

Carrier-based fighters primarily come in three categories — STOVL (short take-off and vertical landing), STOBAR (Short Take-off but Arrested Recovery) and CATOBAR (catapult take-off but arrested recovery).

French aircraft carrier Charles de Gaulle and American carriers use CATOBAR while Indian carriers — INS Vikramaditya and an indigenous one that is under trial — employ STOBAR. That's why foreign fighters have to showcase the capability as a basic requirement.

A fighter aircraft's behaviour for a few seconds after ski-jump take-offs, until wing-borne flight takes place, is critical to achieve a successful launch from carriers.

Rafale M's competitor — the F/A-18 Super Hornet fighter of Boeing — had demonstrated the ski-jump capability in December 2020. However, the demonstration was held at Naval Air Station Patuxent River in the US.

Talks for Naval version of Rafale date back to 2016

Dassault Aviation had been in talks with the Navy for the naval version of the Rafale even before they signed the contract for the 36 air force fighters in 2016.

In 2017, the Navy issued a Request for Information (RFI) to foreign players for 57 new fighters.

However, with the Defence Research and Development Organisation (DRDO) now working on a Twin-Engine Carrier-Based Deck Fighter (TEBDF), the Navy is likely to cut down its requirements for foreign fighters.

Last year, Navy chief Admiral Karambir Singh had also said the force may pursue joint acquisition of fighters with the IAF.

"We have the MiG-29K operating from the Vikramaditya and will operate from the Indigenous Aircraft Carrier (IAC)-I. To replace them, we have taken up a case for the Multi-Role Carrier-Borne Fighters (MRCBF) which we are trying to do along with the IAF," he said.

'Lift of IAC-I can accommodate all aircraft'

Sources in the defence establishment sought to allay fears expressed in some quarters that the lift of the indigenous aircraft carrier was small and would not be able to accommodate either the Rafale M or the F/A-18. While the Boeing fighter comes with foldable wings, Rafale does not.

"The mere fact that both companies are eager to offer their aircraft means that they have taken into account various measurements," a source said, refusing to get into the specifics.

Sources also said that all discussions on the project are happening internally within the Navy and any move to proceed further will depend on what the companies have to offer in terms of cost, including lifecycle costs and future upgrades.

While Dassault is happy to merge naval requirements with that of the Air Force, Boeing is sceptical about it, they added.

https://theprint.in/defence/eye-on-mega-deal-with-navy-dassault-will-fly-rafale-marine-to-india-in-2022-for-showcase-trip/751244/

नवभारत टाइम्स

Tue, 19 Oct 2021

समंदर में भी कापेंगे भारत के दुश्मन, नौसेना को मिल सकते हैं राफेल फाइटर जेट

भारतीय वायुसेना की जान बने राफेल फाइटर जेट जल्द ही नौसेना के तरकश के तीर बन सकते हैं। भारतीय नौसेना राफेल के नेवल वर्जन का परीक्षण करने जा रही है।

हाइलाइट्स

- ***राफेल फाइटर जेट अब समुद्र में भी दुश्मन के कलेजे पर करारा वार कर सकते हैं***
- ***राफेल जेट को बनाने वाली कंपनी दसाल्ट नौसेना के साथ इस संबंध में बात कर रही है***
- ***राफेल का नौसैनिक संस्करण साल 2022 के शुरुआती दिनों में भारत आ सकता है***

पेरिस/नई दिल्ली:

पेरिस/नई दिल्ली: भारतीय वायुसेना की शान बने राफेल फाइटर जेट अब समुद्र में भी दुश्मन के कलेजे पर करारा वार कर सकते हैं। राफेल फाइटर जेट को बनाने वाली फ्रांस की कंपनी दसाल्ट एविएशन नौसेना के साथ इस संबंध में बात कर रही है। बताया जा रहा है कि राफेल का नौसैनिक संस्करण साल 2022 के शुरुआती दिनों में भारत आ सकता है। इस दौरान विमान की स्की जंप क्षमता का परीक्षण किया जाएगा जो भारतीय विमानवाहक पोतों पर से टेकऑफ के लिए बेहद जरूरी है।

समंदर में भी कापेंगे भारत के दुश्मन, नौसेना को मिल सकते हैं राफेल फाइटर जेट

द प्रिंट की रिपोर्ट के मुताबिक फ्रांसीसी कंपनी भारतीय नौसेना के मेगा डील पर अपनी नजरें गड़ाए हुए है। दसाल्ट ने भारतीय नौसेना के डील के लिए राफेल एम या मरीन देने का ऑफर दिया है। भारतीय नौसेना अपने मिग 29के विमानों की जगह पर नए फाइटर जेट चाहती है। एक रक्षा सूत्र ने कहा कि राफेल एम को अभी एयरक्राफ्ट कैरियर से नहीं उड़ाया जाएगा लेकिन गोवा में आईएनएस हंसा पर तटीय इलाके में इसका परीक्षण किया जा सकता है।

अमेरिकी जेट ने अपनी स्की जंप की क्षमता को साबित किया

दसाल्ट को अपने राफेल जेट के नौसैनिक संस्करण पर पूरा भरोसा है और वे खुद ही इसका प्रदर्शन करना चाहते हैं। बताया जा रहा है कि जनवरी महीने में राफेल एम विमान भारत आएगा और इसका परीक्षण किया जाएगा। भारतीय डील के लिए राफेल एम की सीधी टक्कर अमेरिका के एफ/ए-18 सुपर हार्नेट फाइटर जेट से होगी। अमेरिकी जेट ने अपनी स्की जंप की क्षमता को दिसंबर 2020 में साबित किया है।

बताया जा रहा है कि भारतीय नौसेना और दसाल्ट के बीच राफेल को लेकर बातचीत वर्ष 2016 से चल रही है। उसी समय वायुसेना के साथ 36 फाइटर जेट का समझौता हुआ था। वर्ष 2017 में नौसेना ने 57 नए फाइटर जेट खरीदने के लिए इच्छा जताई थी। अब डीआरडीओ खुद का अपना प्लेन बना रही है और माना जा रहा है कि नौसेना अपनी विदेशी फाइटर जेट को खरीदने की संख्या को कम कर सकती है।

https://navbharattimes.indiatimes.com/world/rest-of-europe/dassault-will-fly-rafale-marine-to-india-eye-on-mega-deal-with-indian-navy/articleshow/87101298.cms

Defence News

Defence Strategic: National/International

Press Information Bureau
Government of India

Ministry of Defence

Mon, 18 Oct 2021 4:46PM

Naval Commanders' Conference 21/2

The second edition of Naval Commanders' Conference of 2021 commenced on 18 Oct 2021 at New Delhi. Hon'ble Raksha Mantri Shri Rajnath Singh addressed the Naval Commanders during the inaugural session and interacted with them on matters pertaining to the national security. The conference is attended by all Operational and Area Commanders of the Indian Navy to review major operational, materiel, logistics, Human Resource Development, training, and administrative activities.

RM's Address

"This conference is a very important opportunity to share our views on the key issues facing our country and our Navy"

On Role of Indian Navy in the IOR

"The geographical location of our country is something that makes it unique in many ways. Surrounded by the vast expanse of ocean from three sides, our country is very important from the point of view of strategic, trade and resources"

RM stated that as a responsible maritime stakeholder India supports consensus based principles and a peaceful, open, rule based and stable world order and envision Indian Ocean Region (IOR) with the universal values of rule based freedom of navigation and free trade in which the interests of all participating countries are protected. Being an important country in this maritime route the role of our Navy becomes more important in ensuring the security of this region. The RM expressed happiness at the Navy effectively carrying out these responsibilities.

Speaking about the rapidly changing economic and political relations across the world, RM said that these economic interests do cause some stress in the relations. Therefore, there is a greater need to maintain peace and stability within the Indian Maritime Zones in order to boost the trade and economic activities. India Navy's role in ensuring maintenance of this peace and stability in the region is going to increase manifold in the times to come.

"Only those nations have been successful in gaining dominance across the world, whose Navies have been strong and I am happy to say that our Navy is playing an important role in our maritime and national security"

On Indian Navy's Contribution towards Aatma Nirbhar Bharat Mission

"I am pleased to note that in consonance with Hon'ble PMs vision of 'Aatma Nirbhar Bharat' our Navy has already been ahead in the field of self-reliance, indigenisation in shipbuilding, and manufacturing of submarines etc. It is worth mentioning that in the last five financial years, more than two-thirds of the Navy's Modernisation Budget has been spent on indigenous procurement."

"It is a matter of great pride to know that out of 41 ships and submarines ordered by our Navy, 39 are from Indian shipyards. This is a testament to the Navy's commitment to 'Aatma Nirbhar Bharat'. It is important for us to maintain the momentum of the success we have achieved so far and I am sure that the steps taken by the government will give it more strength".

Wishing success to the conference and the future endeavours of the Indian Navy RM said that "I am sure that in the next three days, all of you will get an opportunity to brainstorm about the efforts and progress of Navy so far, to debate on new ideas".

Launch of "Integrated Unmanned Roadmap for Indian Navy" by RM

The Raksha Mantri also launched the '*Integrated Unmanned Road Map for Indian Navy*'. This publication aims to provide a comprehensive Unmanned Systems Roadmap in consonance with the Indian Navy's Concept of Operations and chart out a capability development plan for the Indian Navy. A reference version of this Roadmap will also be promulgated for the benefit of industry, which will promote India's 'AatmaNirbhar Bharat' mission.

Proceedings of Commanders' Conference

The Conference will focus on addressing the contemporary security paradigms while seeking ways to enhance combat capability of the Navy and make operations more effective and efficient. Detailed review of the performance of weapons/ sensors, readiness of Indian Navy'splatforms; ongoing Naval projects - with focus on ways to enhance indigenisation through 'Make in India' will also be undertaken by the Commanders. The conference would also dwell upon dynamics of the geostrategic situation of the region in the backdrop of recent events.

The Chief of Defence Staff, and the Chiefs of Indian Army and Indian Air Force would also interact with the Naval Commanders to address convergence of the three Services vis-à-vis the operational environment, and on avenues for augmenting Tri-Service synergy and readiness towards defence of the nation and India's national interests.

https://pib.gov.in/PressReleasePage.aspx?PRID=1764695

जागरण

Tue, 19 Oct 2021

भारतीय नौसेना के कमांडर सम्मेलन में शरीक हुए राजनाथ सिंह, समुद्री मामलों पर चर्चा को तैयार हुआ मंच

CDS और थल सेना और वायु सेना के प्रमुख भी नौसेना कमांडरों के साथ बातचीत करेंगे ताकि तीनों सेनाओं के एक्शन आसान हो सकें और त्रि-सेवा तालमेल को बढ़ावा मिल सके। पांच दिवसीय नौसेना कमांडरों का सम्मेलन सैन्य-रणनीतिक स्तर पर महत्वपूर्ण समुद्री मामलों पर चर्चा का एक मंच है।

By Nitin Arora

नई दिल्ली: नौसेना के शीर्ष कमांडर बल सैन्य-रणनीतिक स्तर पर महत्वपूर्ण समुद्री मामलों, भविष्य की योजनाओं पर चर्चा करने के लिए आज अपनी द्विवार्षिक बैठक करने जा रहे हैं। रक्षा मंत्री राजनाथ सिंह, चीफ आफ डिफेंस स्टाफ जनरल बिपिन रावत और नौसेना प्रमुख एडमिरल करमबीर सिंह सेना और वायु सेना के प्रमुखों के साथ नौसेना कमांडरों को संबोधित करेंगे। राजनाथ सिंह सम्मेलन के दूसरे संस्करण में भाग लेने के लिए सेना भवन पहुंचे हैं।

इस दौरान CDS और थल सेना और वायु सेना के प्रमुख भी नौसेना कमांडरों के साथ बातचीत करेंगे ताकि तीनों सेनाओं के एक्शन आसान हो सकें और त्रि-सेवा तालमेल को बढ़ावा मिल सके। बता दें कि पांच दिवसीय नौसेना कमांडरों का सम्मेलन नौसेना कमांडरों के लिए सैन्य-रणनीतिक स्तर पर महत्वपूर्ण समुद्री मामलों पर चर्चा करने के लिए एक मंच के रूप में कार्य करता है। यह अत्यधिक महत्वपूर्ण मुद्दों पर विचार-विमर्श के लिए एक संस्थागत मंच है, जो भारतीय नौसेना के भविष्य के पाठ्यक्रम को आकार देगा।

भारत के बढ़ते समुद्री हितों के अनुरूप बल ने पिछले कुछ वर्षों में अपने परिचालन कार्यों में काफी अच्छी वृद्धि देखी है। हिंद महासागर क्षेत्र में मिशन-आधारित तैनाती पर भारतीय नौसेना के जहाज किसी भी विकासशील स्थिति के लिए त्वरित जवाब देने के लिए तैयार हैं। नौसेना ने एकजुट बल बनाने पर ध्यान केंद्रित किया है और COVID- 19 महामारी के बावजूद, अपने अहम कार्यों को असफल नहीं होने दिया।

https://www.jagran.com/news/national-rajnath-singh-attended-the-commanders-conference-of-the-indian-navy-the-forum-prepared-for-discussion-on-maritime-matters-22125764.html

R. REPUBLICWORLD.COM

Tue, 19 Oct 2021

Indian Army Chief General MM Naravane visits J&K; reviews security situation along LoC

Indian Army Chief General Manoj Mukund Naravane on Tuesday is reviewing the situation in Jammu and Kashmir amid his two-day visit to the Union Territory

By Shloak Prabhu

Indian Army Chief General Manoj Mukund Naravane on Tuesday reviewed the situation in Jammu and Kashmir amid his two-day visit to the Union Territory. This comes amid increased terrorist attacks and targeted killings in the valley. In addition, General MM Naravane's visit also gains significance as forces have stepped up their ante against terrorists in Poonch where anti-terrorist operations are underway.

According to sources, the Army Chief will visit Jammu where he will be briefed by top commanders including General Officer Commanding (GOC) of White Knight Corps, Lieutenant General MV Suchindra Kumar. As of now, COAS General MM Naravane is reviewing the situation along the Line of Control (LoC) in Poonch and Rajouri Sector. Moreover, General Naravane is being briefed by the commanders on the ground.

These developments come amid increased attacks after the ceasefire agreement with Pakistan and the Taliban's takeover of Afghanistan. Security forces are concerned over the threats emanating from the Pakistani side, mainly due to reports that Pakistan is trying to push in more terrorists.

Indian Army soldiers martyred in J&K

In recent days, a total of nine Indian Army bravehearts have been martyred during the anti-terror operations in Poonch district. In the last two days, four bodies- Riflemen Vikram Singh Negi and Yogambar Singh, Subedar Ajay Singh and Naik Harendra Singh- of Army personnel were recovered from a forest in Poonch. The four were missing since a fierce encounter with terrorists on Thursday. In the gun battle that ensued, a JCO and four jawans were martyred. In addition, targeted killings of civilians by terrorists have also increased. The incidents have taken place in broad daylight. Moreover, on October 9, two on-duty Jammu & Kashmir police officials sustained injuries amid rounds of firing and attacks by terrorists.

https://www.republicworld.com/india-news/general-news/indian-army-chief-general-mm-naravane-visits-j-and-k-reviews-security-situation-along-loc.html

Business Standard

Tue, 19 Oct 2021

Navy weighs ordering more P-8Is as Boeing nears end of delivery

Boeing has delivered 11 of the 12 P-8I Poseidon aircraft ordered by India. The Navy is grappling with the question of whether to order more of these lethal aircraft

By Ajai Shukla

New Delhi: The Indian Navy's ability to detect and destroy enemy submarines has been given a substantial boost with The Boeing Company delivering the eleventh of twelve P-8I Poseidon "long-range maritime reconnaissance and anti-submarine warfare" (LRMR-ASW) aircraft ordered by India.

Since the first P-8I Poseidon was inducted into the Indian Navy in 2013 and during the 30,000 flight hours that the Poseidon fleet has logged since then, the aircraft has become the cutting edge of India's ASW arsenal.

The P-8I, which is widely acknowledged to be the world's most deadly LRMR-ASW aircraft, is a derivative of the Boeing 737-800 airliner, onto which a plethora of sensors and weaponry has been fitted.

It has Raytheon multi-mode radar to detect aircraft, surface ships and submarines, while another belly-mounted radar looks backwards like an electronic rear-view mirror. A "magnetic anomaly detector" on the P-8I's tail detects submarines from the magnetic field that large masses of metal (such as submarine hulls) create.

Hostile submarines, once detected, are required to be destroyed. The on-board Harpoon missiles and Mark 54 torpedoes do that. Alternatively, the targets are "handed on" digitally to friendly warships, or submarines, which finish the job.

The Indian Navy became the first international customer for the P-8I in January 2009, when it signed a contract with Boeing for eight aircraft for US $2.177 billion, according to a Comptroller & Auditor General report.

In 2016, the Indian Navy signed a follow-on contract, under the "options" clause in the first contract, for four additional P-8I aircraft. With just one more P-8I aircraft left to be delivered, the navy has been grappling with the question of whether to order more of these lethal aircraft.

Instead of acquiring more P-8I aircraft, the Indian Navy also has the option of buying or leasing MQ-9B Sea Guardian unmanned aerial vehicles (UAVs), which can carry out surveillance of vast expanses of the Indian Ocean. Washington has already leased two of these Category-1 platforms to India after New Delhi became a member of the Missile Technology Control Regime.

Today India operates the largest Poseidon fleet outside the US. Besides the Indian Navy, the P-8 is operated only by the three AUKUS countries: The Royal Australian Air Force, the UK's Royal Air Force and the US Navy.

During several bilateral and multilateral naval exercises with these countries – such as Exercise Malabar, last week – the Indian P-8I crews have developed joint drills and communications protocols with their counterparts that enable them to take swift and lethal action against warships and submarines from hostile countries.

This interoperability has been greatly enhanced by the conclusion of agreements such as Communications Compatibility and Security Agreement (COMCASA) and Basic Exchange and Cooperation Agreement for Geo-Spatial Cooperation (BECA).

In exercises such as Malabar, as in a war with China, the P-8Is would play a crucial role in tracking any Chinese attempt to move their navy from their bases in the South China Sea into the Indian Ocean. To forestall this, the navy's P-8Is would patrol and mount surveillance over four major south east Asian straits – Malacca, Lombok, Sunda and Ombai Wettar.

Boeing says its integrated logistics support package has enabled the P-8I fleet to remain at a high state of readiness at the lowest possible cost. Boeing is completing construction of a Training Support & Data Handling Centre (TSDH) at INS Rajali – the home base for P-8Is at Arakkonam, in Tamil Nadu. A secondary centre is coming up in Kochi at the Naval Institute of Aeronautical Technology, as part of a training-and-support package contract signed in 2019.

Over the years, Boeing has strengthened its supply chain in India, sourcing about $1 billion worth of equipment annually from more than 275 partners, who employ over 10,000 workers. This includes a joint venture with the Tata group to manufacture fuselages for Apache helicopters.

In addition to unmatched maritime reconnaissance and anti-submarine warfare capabilities, the P-8I has been deployed to assist during disaster relief and humanitarian missions. Navy chief, Admiral Karambir Singh, has stated that the maritime aircraft was also used in Ladakh, during the on-going stand-off with the Chinese.

https://www.business-standard.com/article/current-affairs/as-boeing-nears-end-of-p-8i-delivery-navy-weighs-up-more-aircraft-orders-121101801096_1.html

THE HINDU

Tue, 19 Oct 2021

Indian Navy receives 11th P-8I aircraft from Boeing

"This is the third aircraft to be delivered under the option contract for four additional aircraft that the Indian Ministry of Defence awarded in 2016"

The Indian Navy has received the 11th anti-submarine warfare aircraft P-8I from the U.S.-based aerospace company Boeing, according to a statement issued on Monday.

Indian Navy's patrol aircraft Boeing P-8I at INS Rajali in Tamil Nadu. File | Photo Credit: RAGHUNATHAN SR

The Defence Ministry had first signed a contract for eight P-8I aircraft in 2009. Later, in 2016, it signed a contract for four additional P-8I aircraft.

"This is the third aircraft to be delivered under the option contract for four additional aircraft that the Indian Ministry of Defence awarded in 2016," the statement said.

"In addition to unmatched maritime reconnaissance and anti-submarine warfare capabilities, the P-8I has been deployed to assist during disaster relief and humanitarian missions," it added.

The Indian Navy had received the ninth P-8I aircraft in November last year and got the 10th P-8I aircraft in July this year.

The patrol aircraft is an integral part of the Indian Navy's fleet and has surpassed 30,000 flight hours since it was inducted in 2013, the statement added.

"Boeing supports India's growing P-8I fleet by providing training of Indian Navy flight crews, spare parts, ground support equipment and field service representative support," it said.

Boeing's integrated logistics support has enabled a high state of fleet readiness at the lowest possible cost, the statement said.

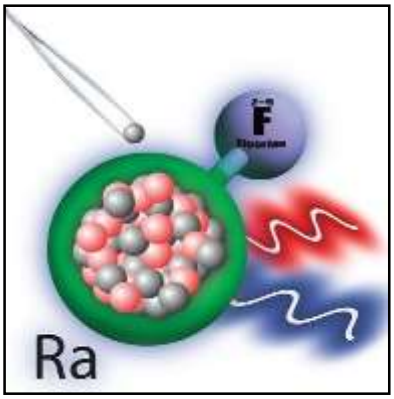
https://www.thehindu.com/news/national/indian-navy-receives-11th-p-8i-aircraft-from-boeing/article37056178.ece

Tue, 19 Oct 2021

Creating and studying radioactive molecules advances nuclear structure and fundamental symmetry studies

An international team performed the world's first measurement of how the size of the radium nucleus modifies the structure of molecules containing different radium isotopes. The research used a combination of lasers and ion traps at the Isotope mass Separator On-Line (ISOLDE) Radioactive Ion Beam Facility at CERN. The team studied the quantum structure of radium monofluoride (RaF) molecules. Quantum structure dictates the energy levels and how these levels change under different conditions. Scientists predict that RaF molecules are useful for studying the violation of certain fundamental symmetries found in nature. The team measured the changes in electronic energy levels when one of the radium nuclei was replaced with a different isotope. This demonstrates the extreme sensitivity of these molecules to the interaction of electrons and nuclei at short distances.

The ability to precisely measure energy levels and modify the number of neutrons in the nuclei of the molecules opens new directions for research. The Big Bang should have created equal amounts of matter and antimatter. Violations of fundamental symmetries can explain why there is more matter than antimatter in our universe. Radioactive molecules containing isotopes of heavy elements like radium are ideal for studying the violation of these fundamental symmetries. Scientists also believe that their experimental developments could be applied to study other radioactive molecules that are created in supernovae and other stellar explosions. But scientists' limited observational tools have prevented their identification in space. Thus, laboratory studies of radioactive molecules will help guide future astrophysical observations.



Changing the number of neutrons (grey spheres) in the radium (Ra) nucleus changes the energy levels of the radium monofluoride (RaF) molecule. Small changes can be measured by using different lasers (blue and red wavy lines). Credit: Silviu-Marian Udrescu, Massachusetts Institute of Technology

Radioactive molecules promise exciting new opportunities at the frontiers of fundamental physics and chemistry. However, they are very rare in nature, and some do not occur in nature at all. This means they must be created artificially at specialized facilities. Moreover, their lifetimes can be as short as a few days or a fraction of a second, so studying them requires extremely sensitive experimental techniques. The Facility for Rare Isotope Beams (FRIB), a Department of Energy (DOE) user facility that will begin operations in 2022 will provide unique access to molecules containing isotopes of the heaviest elements. Future developments of the current techniques at this facility will offer a new platform for discoveries in fundamental physics. This will advance understanding of the fundamental symmetries of nature, as well as an understanding of the chemistry and nuclear structure of the heavy elements.

More information: S. M. Udrescu et al, Isotope Shifts of Radium Monofluoride Molecules, *Physical Review Letters* (2021). DOI: 10.1103/PhysRevLett.127.033001

Journal information: *Physical Review Letters*

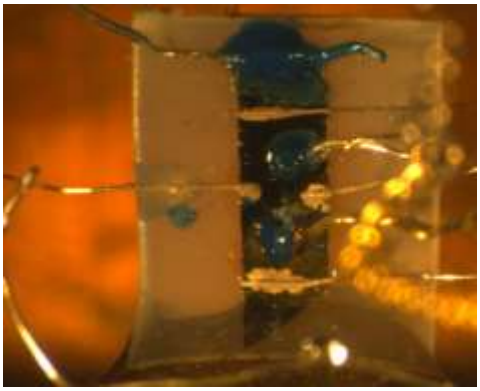
https://phys.org/news/2021-10-radioactive-molecules-advances-nuclear-fundamental.html

PHYS.ORG

Tue, 19 Oct 2021

Experiments reveal formation of a new state of matter: Electron quadruplets

The central principle of superconductivity is that electrons form pairs. But can they also condense into foursomes? Recent findings have suggested they can, and a physicist at KTH Royal Institute of Technology today published the first experimental evidence of this quadrupling effect and the mechanism by which this state of matter occurs.



Reporting today in *Nature Physics*, Professor Egor Babaev and collaborators presented evidence of fermion quadrupling in a series of experimental measurements on the iron-based material, $Ba_{1-x}K_xFe_2As_2$. The results follow nearly 20 years after Babaev first predicted this kind of phenomenon, and eight years after he published a paper predicting that it could occur in the material.

The pairing of electrons enables the quantum state of superconductivity, a zero-resistance state of conductivity which is used in MRI scanners and quantum computing. It occurs within a material as a result of two electrons bonding rather than repelling each other, as they would in a vacuum. The phenomenon was first described in a theory by, Leon Cooper, John Bardeen and John Schrieffer, whose work was awarded the Nobel Prize in 1972.

So-called Cooper pairs are basically "opposites that attract". Normally two electrons, which are negatively-charged subatomic particles, would strongly repel each other. But at low temperatures in a crystal they become loosely bound in pairs, giving rise to a robust long-range order. Currents of electron pairs no longer scatter from defects and obstacles and a conductor can lose all electrical resistance, becoming a new state of matter: a superconductor.

Only in recent years has the theoretical idea of four-fermion condensates become broadly accepted.

For a fermion quadrupling state to occur there has to be something that prevents condensation of pairs and prevents their flow without resistance, while allowing condensation of four-electron composites, Babaev says.

The Bardeen-Cooper-Schrieffer theory didn't allow for such behavior, so when Babaev's experimental collaborator at Technische Universtät Dresden, Vadim Grinenko, found in 2018 the first signs of a fermion quadrupling condensate, it challenged years of prevalent scientific agreement.

What followed was three years of experimentation and investigation at labs at multiple institutions in order to validate the finding.

Babaev says that key among the observations made is that fermionic quadruple condensates spontaneously break time-reversal symmetry. In physics time-reversal symmetry is a mathematical operation of replacing the expression for time with its negative in formulas or equations so that they describe an event in which time runs backward or all the motions are reversed.

If one inverts time direction, the fundamental laws of physics still hold. That also holds for typical superconductors: if the arrow of time is reversed, a typical superconductor would still be the same superconducting state.

"However, in the case of a four-fermion condensate that we report, the time reversal puts it in a different state," he says.

"It will probably take many years of research to fully understand this state," he says. "The experiments open up a number of new questions, revealing a number of other unusual properties

associated with its reaction to thermal gradients, magnetic fields and ultrasound that still have to be better understood."

More information: Vadim Grinenko, State with spontaneously broken time-reversal symmetry above the superconducting phase transition, *Nature Physics* (2021). DOI: 10.1038/s41567-021-01350-9

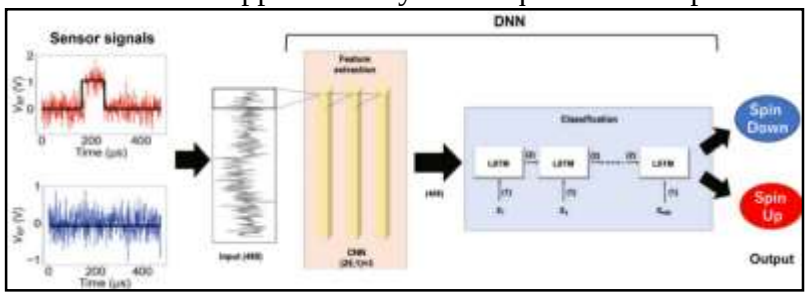
Journal information: *Nature Physics*

https://phys.org/news/2021-10-reveal-formation-state-electron-quadruplets.html

Tue, 19 Oct 2021

Cutting through the noise: AI enables high-fidelity quantum computing

Researchers led by the Institute of Scientific and Industrial Research (SANKEN) at Osaka University have trained a deep neural network to correctly determine the output state of quantum bits, despite environmental noise. The team's novel approach may allow quantum computers to become much more widely used.



Architecture of the DNN classifier . Credit: Yuta Matsumoto et al.

Modern computers are based on binary logic, in which each bit is constrained to be either a 1 or a 0. But thanks to the weird rules of quantum mechanics, new experimental systems can achieve increased computing power by allowing quantum bits, also called qubits, to be in "superpositions" of 1 and 0. For example, the spins of electrons confined to tiny islands called quantum dots can be oriented both up and down simultaneously. However, when the final state of a bit is read out, it reverts to the classical behavior of being one orientation or the other. To make quantum computing reliable enough for consumer use, new systems will need to be created that can accurately record the output of each qubit even if there is a lot of noise in the signal.

Now, a team of scientists led by SANKEN used a machine learning method called a deep neural network to discern the signal created by the spin orientation of electrons on quantum dots. "We developed a classifier based on deep neural network to precisely measure a qubit state even with noisy signals," co-author Takafumi Fujita explains.

In the experimental system, only electrons with a particular spin orientation can leave a quantum dot. When this happens, a temporary "blip" of increased voltage is created. The team trained the machine learning algorithm to pick out these signals from among the noise. The deep neural network they used had a convolutional neural network to identify the important signal features, combined with a recurrent neural network to monitor the time-series data.

"Our approach simplified the learning process for adapting to strong interference that could vary based on the situation," senior author Akira Oiwa says. The team first tested the robustness of the classifier by adding simulated noise and drift. Then, they trained the algorithm to work with actual data from an array of quantum dots, and achieved accuracy rates over 95%. The results of this research may allow for the high-fidelity measurement of large-scale arrays of qubits in future quantum computers.

More information: Yuta Matsumoto et al, Noise-robust classification of single-shot electron spin readouts using a deep neural network, *npj Quantum Information* (2021). DOI: 10.1038/s41534-021-00470-7

https://phys.org/news/2021-10-noise-ai-enables-high-fidelity-quantum.html

EurekAlert!

Tue, 19 Oct 2021

New COVID-19-discovery could predict patient death or hospitalization

As parts of the Western world is slowly returning to normal, many countries in the low- and middle-income countries are still fighting and fearing new outbreaks of COVID-19. And for most it feels almost unbearable to endure another new wave of the virus, which could end in more deaths and long-term persistent symptoms from COVID-19 infection.

In a new study, researchers from University of Copenhagen present what could be a much-needed helping hand to fight the virus. The study shows that analysis of a particular protein on the cell surface is likely to predict who is in danger of a serious infection caused by the virus, explains Assistant Professor Rajan Gogna, lead author of the new study.

"Cells have a so-called fitness status, and by analyzing it we could predict hospitalization or death in COVID-19 patients, potentially making such a biomarker an earlier prediction tool, especially because it can be detected from the common nasal swap covid-19-tests," says Rajan Gogna from the Won Group at the Biotech Research & Innovation Centre.

If the cell fitness status is poor, it indicates that the cell does not develop well, either because the cell is aged, lacks reliability, has an ill-functioning metabolism or is disease prone etc. Earlier in 2021, the research team discovered that fitness status is expressed in proteins called flower proteins. These flower proteins are on the surface of the cell, and they are expressed in two forms, explains Rajan Gogna.

"In one form, they tell the surrounding cells that this cell is doing well. In the other form, they indicate to the surrounding tissue, that this particular cell are not doing well and thus has a bad fitness status. If the cell's fitness status is not great, the cell will get phased out and killed by the surrounding cells."

Accurate prediction of serious infection

Especially helpful in cases of the early phase of COVID-19 illness, the flower protein expression could accurately predict hospitalization or death as well predict who would have a less serious infection.

"The method could predict who needed hospitalization with an accuracy of was 78.7 percent. With COVID-19 patients who would not have a serious infection, the prediction was accurate at 93.9 percent," says Associate Professor and Group Leader Kyoung Jae Won, who analyzed the data using machine learning.

In order to analyze the data, the researchers performed a post-mortem examination of the infected lung tissue in deceased COVID-19 patients to determine the flower proteins biological role in acute lung injury, which is the main cause of death from the disease.

By using nasal swap samples, they also performed an observational study to evaluate whether the protein expression could accurately predict hospitalization or death.

"The cell fitness, expressed by the flower protein, could help explain why some people respond poorly to COVID-19 and provide opportunity for pre-identification of high-risk individuals. This discovery has the potential to help save their lives by severely alerting them to be extra protective of themselves, or until they are fortunate enough to get their hands on a vaccine. In some other

nations, the population in general has great hesitancy against vaccination. But people are not hesitant about a test, and we hope this will improve outcomes," says Rajan Gogna.

Cell fitness is not just about your age

Cell fitness is relative to many things in our bodies and does not necessarily alter with age. Age has an impact, but the researchers have seen many cases from their database where people who are 80 years of age have a very good fitness profile of lungs, which is the main area where cell fitness is measured to predict COVID-19 infection outcome, explains Rajan Gogna.

"We have also seen young people die in countries like India, Indonesia and Brazil. Because it is not only age but the comorbidities which has an impact on the fitness level of the cell in both the upper and lower respiratory tract. Also the insulin signaling, diabetes and hypertension is known to play a role in determining the cell fitness," says Rajan Gogna.

The researchers hope their discovery is timely, because of the persistency of COVID-19 and rising cases and deaths in various nations outside the Western world despite vaccines.

"In many countries, the populations need protection from the worst outcomes. We believe that these places could benefit from our discovery," says Rajan Gogna.

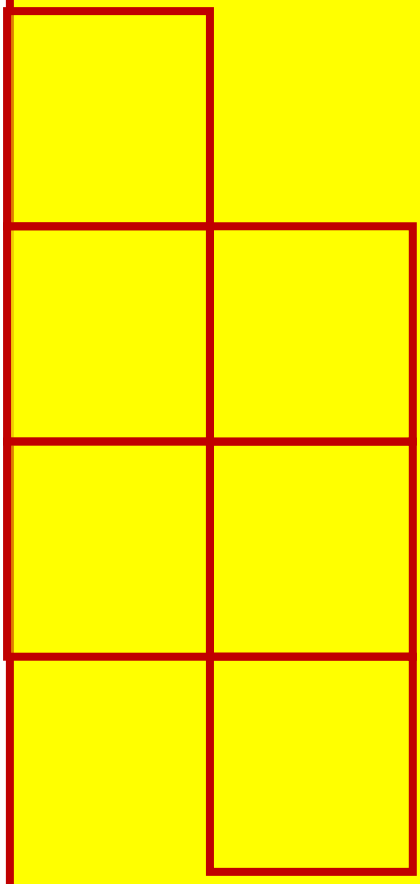
Journal

EMBO Molecular Medicine

DOI

10.15252/emmm.202013714

https://www.eurekalert.org/news-releases/931890



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