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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

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CONTENTS

S. No.	TITLE	Page No.
DRDO News		1-12
DRDO Technology News		1-11
1.	ड्रोन अटैक को मात देने के लिए तैयार हो रहा DRDO का एंटी ड्रोन सिस्टम, ऐसे करेगा काम...	1
2.	India's latest Agni-P Ballistic Missile sparks a fierce debate between Chinese & Indian Experts	2
3.	Indian Army to get major bridge boost for operations along western borders	4
4.	Drones a clear, present threat, says Army Chief	5
5.	India needs anti-drone systems now as border infra are targets of Pak groups	7
6.	Explained: Facing up to the drone challenge	8
7.	New threat perceptions confront India	10
DRDO on Twitter		11-12
Defence News		13-21
Defence Strategic: National/International		13-21
8.	Raksha Mantri Shri Rajnath Singh holds virtual interaction with his Vietnamese counterpart;	13
9.	रक्षा मंत्री श्री राजनाथ सिंह ने वियतनाम के रक्षा मंत्री के साथ वर्चुअल माध्यम से बातचीत की,	14
10.	Air Marshal BR Krishna AVSM SC assumes the Command of Western Air Command	15
11.	Air Marshal Vivek Ram Chaudhari PVSM AVSM VM assumes charge as Vice Chief of The Air Staff	16
12.	Vice Chief of Army Staff visits forward areas in Northern Command	17
13.	7th Indian Ocean Naval Symposium (IONS)	18
14.	Military should fund its own modernisation	19
15.	Working towards preventing drone attacks: Army Chief	21
Science & Technology News		22-27
16.	Scientists advance the understanding of potential topological quantum bits	22
17.	New ternary hydrides of lanthanum and yttrium join the ranks of high-temperature superconductors	24
18.	Non-stop signal achieved in high-power Erbium-doped mid-infrared lasers	25
COVID-19 Research News		26-27
19.	Study identifies risk factors for severe COVID-19 in individuals with sickle cell disease	26



Fri, 02 July 2021

ड्रोन अटैक को मात देने के लिए तैयार हो रहा DRDO का एंटी ड्रोन सिस्टम, ऐसे करेगा काम...

जम्मू में हुए ड्रोन अटैक के बाद सुरक्षा एजेंसियां अलर्ट पर हैं। डीआरडीओ द्वारा एक ऐसे एंटी ड्रोन सिस्टम पर काम किया जा रहा है, जो इस तरह के अटैक को विफल कर सकता है।

By मंजीत नेगी/गौरव सावंत

स्टोरी हाइलाइट्स

- डीआरडीओ कर रहा एंटी ड्रोन सिस्टम पर काम
- 3 किमी. रेंज में ड्रोन को मार गिराने में सक्षम

जम्मू में वायुसेना के एयरबेस पर हाल ही में हुए ड्रोन अटैक के बाद सुरक्षा एजेंसियां चौकन्ना हो गई हैं। इस अटैक के बाद भी जम्मू के कुछ हिस्सों में ड्रोन देखा गया है। इस बीच अब इस मामले में रक्षा विकास एवं अनुसंधान संगठन (DRDO) एक्टिव हुआ है और उसके एंटी-ड्रोन सिस्टम की चर्चा जारी है। इस एंटी ड्रोन सिस्टम की क्या खासियत है, इस मसले पर आजतक ने डीआरडीओ की महानिदेशक जी. मंजुला से बातचीत की।



ऐसे काम करेगा ये एंटी ड्रोन सिस्टम

ड्रोन अटैक से निपटने की हो रही है तैयारी (सांकेतिक तस्वीर)

जी. मंजुला इस एंटी-ड्रोन सिस्टम पर पिछले तीन साल से काम कर रही हैं। उनके मुताबिक, यह सिस्टम तीन किलोमीटर के दायरे में आने वाले छोटे ड्रोन का पता लगाकर उसे जाम कर देता है। इसके साथ ही यह सिस्टम 1 से 2।5 किमी. के दायरे में आए ड्रोन को अपनी लेज़र बीम से निशाना बनाते हुए उसे नीचे गिरा देता है।

DRDO ने ऐसी तकनीक विकसित की है, जो या तो जैमिंग कमांड के माध्यम से माइक्रो ड्रॉन्स को नीचे ला सकती है या लेजर पर आधारित निर्देशित ऊर्जा हथियार के माध्यम से ड्रॉन्स के इलेक्ट्रॉनिक्स उपकरण को नुकसान पहुंचा सकती है।

निजी कंपनियों के साथ मिलकर काम...

जी मंजुला ने बताया कि अगले 6 महीनों में ये सेनाओं को मिल सकता है। डीआरडीओ ने अपने एंटी-ड्रोन सिस्टम का उत्पादन भारत इलेक्ट्रॉनिक्स लिमिटेड (बीईएल) को सौंपा है। डीआरडीओ अपने इस

सिस्टम की तकनीक निजी कंपनियों से साझा करने के लिए भी तैयार है, इसके लिए निजी कंपनियों को उससे लाइसेंस लेना होगा।

DRDO की ओर से विकसित इस एंटी-ड्रोन सिस्टम (Anti Drone System) की तैनाती 2020 के स्वतंत्रता दिवस के मौके पर वीवीआईपी लोगों को सुरक्षा देने के लिए हुई थी। इसके अलावा अमेरिकी राष्ट्रपति डोनाल्ड ट्रंप जब अहमदाबाद के मोटेरा स्टेडियम पहुंचे थे, उस समय भी इस सिस्टम को वहां लगाया गया था। वहीं इस साल रिपब्लिक-डे परेड के दौरान भी इसकी सेवा ली गई थी।

क्या बोले आर्मी चीफ?

ड्रोन अटैक को लेकर आर्मी चीफ एम.एम. नरवने ने कहा है कि ड्रोन का उपयोग तेज़ी से हो रहा है। सेना की ओर से ड्रोन के रक्षात्मक और आक्रामक इस्तेमाल पर जोर दिया जा रहा है, साथ ही इसे काउंटर करने के लिए काम चल रहा है। एम. एम. नरवने ने कहा कि एलओसी पर हमारी ओर से बातचीत की जा रही है, हाल ही में जम्मू-कश्मीर में घुसपैठ कम हुई है और आतंकी गतिविधि में भी कमी आई है।

गौरतलब है कि जम्मू के जिस एयरबेस पर ड्रोन अटैक हुआ था, अब वहां पर एंटी ड्रोन सिस्टम, जैमर और अन्य हथियारों की तैनाती कर दी गई है। एयरबेस के अलावा भी जम्मू के कुछ इलाकों में ड्रोन की गतिविधियों को देखा गया था, जिसके बाद सुरक्षा एजेंसियां अलर्ट पर हैं। प्रधानमंत्री नरेंद्र मोदी ने भी गृह मंत्री अमित शाह, रक्षा मंत्री राजनाथ सिंह समेत अन्य लोगों के साथ मिलकर इस मसले पर चर्चा की थी।

<https://www.aajtak.in/india/news/story/drdo-anti-drone-system-jammu-drone-attack-new-technique-details-ntc-1282787-2021-07-01>



Fri, 02 July 2021

India's latest Agni-P Ballistic Missile sparks a fierce debate between Chinese & Indian Experts

By Aproova Jain

India's Agni-P (Prime) ballistic missile is the latest addition to the country's growing nuclear arsenal. While a Chinese military expert casts doubt on the missile's actual capability, an Indian analyst has countered this by saying Agni-P is "aimed exclusively at China".

India has recently test-fired the next-generation nuclear-capable missile amid border tensions with China. With a range of 1,000-2,000 km, Agni-P is said to be the smallest and lightest of the Agni series and is equipped with a canister-based launch system.

It enables the missile to be launched via a canister and makes its transportation and movement easier.

While congratulating Defence Research and Development (DRDO), India's Defence Minister Rajnath Singh noted the advanced technologies used in the missile including "composites, propulsion systems, innovative guidance and control mechanisms and state-of-the-art navigation systems".

"The Agni-P missile would further strengthen India's credible deterrence capabilities," Singh said.

South China Morning Post quoted Chinese defense analysts who compared India's Agni-Prime with



The Agni-P ballistic missile being test-fired from Dr APJ Abdul Kalam island off the coast of Odisha. (Image: DRDO)

China's DF-21D, known as an "aircraft carrier killer", the world's first anti-ship ballistic missile.

According to Song Zhongping, a Chinese military commentator and a former PLA instructor, the Agni-P will need further testing to prove its anti-ship capability after the successful first firing.

"Hitting a warship with a ballistic missile is a complex systematic project. It takes not only the missile itself but also many other support systems – such as satellite navigation, terminal target identification, guidance, and maneuvering systems," Zhongping told SCMP.

The Agni Series

The Agni missiles are a part of India's Integrated Guided Missile Development Program (IGMDP), the brainchild of scientist and former President Dr. A.P.J Adbul Kalam. They were developed by the DRDO to act as deterrence & meet the country's security requirements.

The first ballistic missile of the Agni series, Agni-I, was inducted into service in 2004. The nuclear-capable version of Agni-I went for trials from 2010 onwards.

While Agni-I and II are medium-range missiles, capable of reaching distances more than 700 km and 2,000km, Agni-III and IV are intermediate-range ballistic missiles reaching beyond 3,000km. The nuclear-capable inter-continental ballistic missile (ICBM), Agni-V is the longest of the Agni family with a range of 5,000-plus kilometers. It provides a nuclear deterrence against China, with the capacity to reach Beijing, China's capital city.

It has successfully been test-fired several times and the induction into the armed forces is expected soon.

Deterrence against China

After reports of possible deployment of Agni-V missile in January, Chinese state-run Global Times in an editorial called India's recent efforts in upgrading military capabilities as "going too far with strategic overdrafts".

The South China Morning Post also noted that Agni-P is unlikely to pose a big threat to China given that major cities like Beijing are beyond its reach.

However, Indian defense analysts have lauded the timing of the tests amid the border tensions between India and China.

Speaking to The EurAsian Times, Abhijit Iyer-Mitra, a research fellow at the Institute of Peace and Conflict Studies, noted that the "Agni-Prime is aimed exclusively at China since we've achieved nuclear deterrence with Pakistan way before".

"The more you keep demonstrating these missiles, the more deterrence you technically build up. There's more to it as there are several steps to deterrence and at some point, you might have to leak photos of 15-20 of them amassed somewhere," he said.

When asked about what makes Agni-P more effective against China given its limited range of 2,000 km as compared to Agni-V (which can reach anywhere in China), Mitra said the Agni-Prime is different from the previous missiles.

"Many of the earlier missiles went through stage-separation which hasn't been used for a while now, giving a single solid missile. It's much smaller, more compact and shows that you're developing your missile technology. Demonstrating that you're developing is an important part of deterrence," he said. "When you've got a shorter, smaller missile which is capable of hitting places like Chengdu, Sichuan and possibly Hong Kong, it adds a different layer of deterrence," he noted.

Calling it a "deterrence of modernization", Mitra noted that "Agni-P is a more modern missile within a range and regions that we've already covered but having a much shorter reaction time and easier to transport and other improvements makes it of a different caliber.

"Modernization brings a different type of deterrence for which an extension of range isn't always necessary," he further said. Mitra noted that since the successful test-firing, there have been no reactions from either China or Pakistan, India's arch-rivals. "I did not hear any reaction at all, either from China or Pakistan," he said.

<https://eurasianimes.com/indias-latest-agni-p-ballistic-missile-sparks-a-fierce-debate-between-chinese-indian-experts/>

Indian Army to get major bridge boost for operations along western borders

In a major boost for 'Make in India' in defence sector, the Indian Army would be getting the first 12 indigenously developed 10 metre Short Span Bridging systems on Friday, which will help the force come over geographical obstacles like small rivers and canals in case of operations along the western borders with Pakistan.

The equipment would be handed over to the Corps of Engineers by Army Chief General Manoj Mukund Naravane at Delhi Cantt and is worth over Rs 492 crore, Army officials said.

The system has been designed by Indian Army Engineers along with DRDO and manufactured by Larsen and Toubro Limited within the country, they said. The officials said that despite the COVID restrictions placed on industries in the last one year the supply of the bridging systems to the Indian Army has been on schedule.



The bridges being inducted are mechanically launched and capable of carrying tanks upto 70 tons over different types of water obstacles.

The unique feature of the system is its compatibility with existing Bridging systems which enhances flexibility to negotiate all types of water obstacles along western borders, they said.

It enhances the existing bridging capability of the Corps of Engineers by multiple folds and would be a major game-changer in support of mechanised operations in any future conflict with our western adversary, they said.

<https://www.freepressjournal.in/india/indian-army-to-get-major-bridge-boost-for-operations-along-western-borders>

Drones a clear, present threat, says Army Chief

Indian Army chief General Manoj Mukund Naravane on Thursday said that the easy availability of drones allowed both state and non-state actors to use them, increasing the complexity of challenges faced by the security forces, days after an unprecedented unmanned attack on an Indian Air Force (IAF) station in Jammu

By Rahul Singh

New Delhi: Indian Army Chief General Manoj Mukund Naravane on Thursday said that the easy availability of drones allowed both state and non-state actors to use them, increasing the complexity of challenges faced by the security forces, days after an unprecedented unmanned attack on an Indian Air Force (IAF) station in Jammu.

Highlighting the easy availability of devices such as the ones used in Jammu on June 27 -- and several other drones seen and repelled in the region's Kaluchak area over the past week -- he said that building drones was akin to a "DIY project that could be tackled at home". The attack was the first-ever offensive use of drones to target an Indian military facility.

"Drones will increasingly be used in all sorts of combat in future by state and non-state actors. We will have to factor it in our future planning," the army chief said at a seminar organised by the Global Counter Terrorism Council, a think tank. Steps are being taken to counter the drone threat, he added.

"We are developing the capability to deal with this threat in both kinetic and non-kinetic realms. Troops have also been sensitised to the evolving threat...we are focusing on offensive use of drones as well as adopting counter-drone technology to prevent any attacks on our critical facilities either by state or non-state actors," he said.

The technology used in the aerial attack in Jammu indicated "state support and the possible involvement of Pakistan-based Jaish-e-Mohammed and Lashkar-e-Taiba terror groups," Lieutenant General DP Pandey, who heads the Srinagar-based 15 Corps, said on Wednesday.

The army and IAF have tightened security and activated countermeasures at their forward bases to pre-empt such aerial attacks. Pandey said there appeared to be an "element of guidance from state actors" to modify the drones for aerial attacks.

The Jammu attack is a wake-up call, but it must be appreciated that the threat has been long in existence, and the antidote to terror drones is a whole-of-government approach since it's not only military installations that are threatened but civilian infrastructure of importance too, said Air Vice Marshal Manmohan Bahadur (retd), former additional director general, Centre for Air Power Studies.

"Thus, the IB, RAW and other intelligence agencies have to work hand-in-hand to pre-empt attacks and terminal anti-drone defences have to be provided to key installations. In these Covid crunch times, finances would have to be provisioned from somewhere by the government," Bahadur said on Wednesday.

The drone attack is a watershed in asymmetric warfare and underlines the need for the armed forces to build capabilities to deter, detect and neutralise such aerial threats.

He said, "The seesaw battle between drone warfare and counter-drone technologies will keep evolving. We will have to keep adapting," he said.

The army chief also talked about achieving self-reliance in niche areas to tackle new threats. "In order to harness niche technologies like artificial intelligence (AI), exploit our depth in IT and realise the vision of Atmanirbhar Bharat, we need to shed old mindsets and make our procedures more flexible and adaptive," Naravane said.

The imaginative and offensive use of drones, riding on AI algorithms, first in Idlib and then in the Armenia-Azerbaijan conflict, have challenged the traditional military hardware such as tanks, artillery and infantry, Naravane said.

In Syria's Idlib, Turkish forces successfully used drones to carry out attacks against Syrian tanks, air defence systems and other assets. Also, Azerbaijan made extensive use of Kamikaze drones to target and inflict losses on Armenian forces in a conflict last year.

"More recently, the Israel Defence Forces have hailed the just-concluded 11-day conflict with Hamas, as the first Artificial Intelligence War. Whether it was the famed Iron Dome neutralising incoming rockets to great effect or the air targeting of Hamas locations in the Gaza strip, Israel has credited its success to the accomplishments in the field of AI," he said.

Chief of defence staff General Bipin Rawat on Monday said that India has to start preparing for future generation warfare. He said the three services, the Defence Research and Development Organisation (DRDO), academia and other stakeholders were working together to develop technology to counter the threat from drones at the earliest.

The drone threat has surfaced at a time the armed forces are undergoing a major restructuring drive. Theaterisation plans are being refined to integrate the capabilities of the three services and optimally utilise their resources for future wars and operations. The plans cover the setting up of an Air Defence Command to protect key assets and installation from airborne attacks by standalone weapons such as armed drones, rockets and missiles.

DRDO chief G Satheesh Reddy said that the counter-drone technology developed by his organisation could provide the armed forces with the capability to swiftly detect, intercept and destroy small drones that pose a security threat. He said DRDO's anti-drone system would give the military both "soft kill" and "hard kill" options to tackle the aerial threat. The first refers to jamming the hostile drone, while the second involves a laser-based kill system.

The DRDO's counter-drone technology uses a variety of methods to neutralise the danger from such aerial attacks. DRDO officials previously explained how the system works. The solution consists of a radar system that offers 360-degree coverage with detection of micro drones when they are 4km away, electro-optical/infrared (EO/IR) sensors for detection of micro drones up to 2 km and a radio frequency (RF) detector to detect RF communication up to 3 km. "The radar detects micro drones and hands over the track for soft kill and hard kill after due verification by a sensor. Once confirmed by RF detection and verified by EO/IR sensor, the system is ready to jam RF/GNSS signals or use laser weapon as per standard operating procedures," an official said.

<https://www.hindustantimes.com/india-news/drones-a-clear-present-threat-says-army-chief-101625162737716.html>

India needs anti-drone systems now as border infra are targets of Pak groups

Since 2020, the Border Security Force has recorded no less than 99 drone sightings on the western borders - from Jammu and Kashmir to Gujarat

By Shishir Gupta

New Delhi: The drone attack by Pakistan based Lashkar-e-Taiba (LeT) terror group on Jammu air base last Sunday has red-flagged the need for India to acquire latest anti-drone technologies as terrorists and Maoists have started using stand-off weapons at the behest of their handlers across the borders.

The attack has also brought home the stark truth to not only the national security planners but as well as the air warriors who thought that the armed drones will not be able to survive the hostile environment of the Line of Control (LoC) between India and Pakistan with both countries deploying air defence radars along the active line. The Sunday attack showed that how a mere system costing around six lakh of rupees can cause damage to the Indian Air Force's (IAF) key installations.

Fact is that since 2020, the Border Security Force (BSF) has recorded no less than 99 drone sightings on the western borders - from Jammu and Kashmir to Gujarat. To add to the discomfiture is that the BSF has even sighted drones in Maoist infested areas of eastern India. The Indian intelligence agencies and the J&K police know that both Lashkar and Jaish-e-Mohammed have better capability that the drone used in the June 27 attack with majority of drones being used to drop weapons in the Jammu sector.

The national security council secretariat is aware of the threat posed by terror drones to Indian security for the past few years but the Indian acquisition processes are so tedious that to date only a request for information (RFI) has been floated for acquisition of anti-drone systems. The Defence Research and Development Organization has also developed a demonstrator anti-drone system but that is still to be tested either on the LoC or the Line of Actual Control (LAC). The DRDO system was tested in NSG facility in Manesar in January 2021 but the users have to still to take a final call.

While China has moved far ahead in armed and swarm drone technologies with Pakistan being a collateral beneficiary, the Indian drone and anti-drone capability is still work in progress. This is perhaps also to do with the fact that the Indian military and security forces take time to assimilate new technologies despite the fact that US has used the drones to good effect in Afghanistan and Balochistan to take out high value terror targets. There are many within the security establishment who believe that drones cannot stand a chance in a contested air space and will be detected and brought down. This was proved wrong on June 27 as the two drones not only intruded across the border without detection (which is very difficult in mountainous terrain) but also dropped the payload using GPS coordinates. Had it not been windy in the wee hours of last Sunday morning, the LeT would have embarrassed the IAF.

The truth is that even if the two drones had been detected and shot down by the BSF, are the Indian security forces prepared for swarm drones attacks on Indian vital installations all along the border. An armed drone is a cheap option for targeting by anti India terror groups as the controller sits across the border and achieves the objective without crossing the LoC by tunneling under the border fence. India has no options but to rapidly acquire anti-drone systems by involving the



The June 27 twin drone attack was orchestrated by LeT across the border in Shakargarh sector with air traffic control, radar and parked helicopter as possible targets.

private sector while the public sector can continue developing its own. A perfect drone strike by Pakistan based terror groups will destroy the much earned LoC ceasefire but also bring the two arch rivals to each other's throats.

<https://www.hindustantimes.com/india-news/india-needs-anti-drone-systems-now-as-border-infra-are-targets-of-pak-groups-101625125370929.html>



Fri, 02 July 2021

Explained: Facing up to the drone challenge

Sunday's drone attack in Jammu underlines an emerging threat as well as a need to build capacity in this field. How is India placed in drone technology and offensive measures to counter such attacks in future?

By Deeptiman Tiwary, Krishn Kaushik

New Delhi: In the early hours of Sunday, two drones dropped an IED each packed with high grade-explosives on an Indian Air Force base in Jammu. One IED broke through the roof of a building while the other dropped a few yards away, injuring two IAF personnel. It was the first-ever attack in India where suspected terrorists had used drones.

Army Chief General M M Naravane emphasised this new threat on Thursday and said DIY (do it yourself) drones can be easily accessed and used by state and non-state actors, and India is building its offensive and defensive capabilities to prevent such attacks.



Drone surveillance during anti-CAA protests at Red Fort in December 2019. (File photo)

Since when have the military and terrorists been using drones?

Over the last one decade, drones, or unmanned aerial vehicles (UAVs), are being increasingly used for law and order, courier services, and surveillance and attack in the military domain. Modern drones are being used militarily since the 1990s, including by the US during the Gulf War.

UAVs range from 250 g (maximum altitude 2,000 ft and range 2 km) to over 150 kg (300,00 ft and unlimited range). In India, the most commonly known drones are quad- and hexacopters used for civil and commercial purposes, and Heron drones used for military surveillance. Different UAVs operate under various technologies ranging from remote control by a human operator to using GPS and radio frequencies, and autopilot assistance.

According to Association of the US Army (AUSA), the first attempted drone attack by a terror group can be traced to 1994 when Aum Shinrikyo, a Japanese doomsday cult, used a remote-controlled helicopter to spray sarin gas, but failed as the helicopter crashed.

In 2013, al-Qaeda attempted an attack in Pakistan using multiple drones but security forces prevented it. The Islamic State has regularly used drones for attacks in Syria and Iraq, while the Taliban has used them for surveillance in Afghanistan. Hezbollah and Houthi rebels too have used them for attacks.

In January 2018, a swarm of 13 drones attacked two Russian military bases in Syria. In August 2018, an assassination attempt was made on the President of Venezuela, Nicol s Maduro, using two IED-carrying GPS-guided drones that exploded during a military ceremony the President was attending.

According to AUSA, between 1994 and 2018, more than 14 planned or attempted terrorist attacks took place using drones. These have only increased in the last couple of years.

Last year, drones were used to counter traditional platforms like tanks in the Armenia-Azerbaijan war. Naravane referred to it on Thursday and said the “imaginative and offensive use of drones, riding on (Artificial Intelligence) algorithms, first in Idlib and then in Armenia -Azerbaijan, have challenged the traditional military hardware of war: the tanks, the artillery and the dug in infantry”.

What’s the Indian experience?

In the last few years, India and its enemies have frequently used drone surveillance against each other. The last three years have also seen drones dropping weapons, ammunition and drugs. On May 14, the BSF detected weapons dropped by a suspected Pakistan drone in Jammu. One AK-47 assault rifle, one pistol, one magazine, and 15 rounds for a 9 mm weapon were recovered 250 m inside Indian territory.

On June 20 last year, the BSF shot down a drone in Hiranagar, Jammu. The hexacopter’s payload included a US-made M4 semi-automatic carbine, two magazines, 60 rounds and seven Chinese grenades.

Sources said in recent years there have been an estimated 100-150 sightings of suspected drones near India’s western border annually. Most of these are suspected to be surveillance drones.

How to tackle them?

The entire world is struggling with the problem of drone attacks. Conventional radar systems are not meant for detecting small flying objects, and, even if they are calibrated that way, they might confuse a bird for a drone and the system may get overwhelmed.

Currently, border forces in India largely use eyesight to spot drones and then shoot them down. It is easier said than done as most rogue drones are very small and operate at heights difficult to target.

India has been exploring technologies to detect and disable drones using electromagnetic charge or shoot them down using laser guns. Technology to disable their navigation, interfere with their radio frequency, or just fry their circuits using high energy beams have also been tested. None of these has, however, proven foolproof.

“One would ideally like to have a tech wall that can disable drones coming from across the border. But drone attacks can be launched from within as well. Then there is the problem of swarm drones, where scores of drones overwhelm and confuse detection systems, resulting in some of the drones sneaking through,” a security establishment officer said.

What are the other challenges in tackling small drones?

A senior armed forces officer, who has worked on UAV projects earlier, said the use of small drones to attack is a “totally different spectrum”. Drones have control and delivery mechanisms, and to counter them, he said, “either you can counter the control mechanism by jamming, or can control the delivery mechanism”. It depends on what kind of radar is being used, which is critical for the size of the UAV that needs to be detected.

“When you have to look at any kind of counter-strategy, it should give you enough warning to positively identify that it is not a bird, to fire. If you are firing, you don’t know what it is carrying.”

He said it raises multiple questions, like who (the armed forces or the civilian forces) would be responsible for such mechanisms. “It is a sub-tactical threat, but requires a strategic response. Entire threat perception has to be relooked.”

Does India have anti-drone technology?

The Defence Research and Development Organisation (DRDO) has developed a detect-and-destroy technology for drones, but it is not yet into mass production. Then there is the challenge of the technology’s strategic deployment and the money the government is ready to spend.

The DRDO’s Counter-Drone System was deployed for VVIP protection at the Republic Day parades in 2020 and 2021, the Prime Minister’s Independence Day speech last year, and former US President Donald Trump’s visit to Motera Stadium, Ahmedabad last year.

The DRDO system, developed in 2019, has capabilities for hardkill (destroying a drone with lasers) and softkill (jamming a drone's signals). It has a 360° radar that can detect micro drones up to 4 km, and other sensors to do so within 2 km. Its softkill range is 3 km and hardkill range between 150 m and 1 km.

It has been demonstrated to various security agencies including at the Hindon Air Force station in January 2020 and National Security Guard Manesar in August 2020 and again in January 2021.

What are India's plans to use them in warfare?

The armed forces have been slowly inducting capacity. Last year the, Navy got two unarmed SeaGuardian Predator drones on lease from the US. The three forces want 30 of these UAVs between them.

The military has been working towards using small drones for offensive capabilities as well. On January 15, during the Army Day parade, the Army showcased its swarm technology, with 75 drones swarming together to destroy simulated targets. The Army Chief mentioned this on Thursday and said the “display of pre-programmed drones destroying a variety of simulated targets is reflective of our seriousness and focus on this emerging technology” and added that “much work is underway in this direction to operationalise the capability in different terrains, at varying altitudes and over extended ranges”.

<https://indianexpress.com/article/explained/drone-attack-ied-indian-air-force-base-jammu-7385106/>



Fri, 02 July 2021

New threat perceptions confront India

Highlights

Drones have been sighted in the Union Territory of Jammu every day this week since the drone attack at the Indian Air Force (IAF) station in Jammu in the early hours of June 27 forcing the authorities to rethink counter-terror strategies

Drones have been sighted in the Union Territory of Jammu every day this week since the drone attack at the Indian Air Force (IAF) station in Jammu in the early hours of June 27 forcing the authorities to rethink counter-terror strategies.

Drones were spotted at three places on the outskirts of Jammu city on June 29 night and in the early hours of June 30, keeping the police and other security agencies on tenterhooks.

On June 28, the Indian Army claimed to have spotted drones flying over Kaluchak and Ratnuchak military stations and opened fire at them, making them fly away. This is the first instance of deployment of drones to strike at vital installations of our country by terrorists guided by Pakistan.

The banned Lashkar-e-Taiba terror outfit is suspected to have been behind the sensational drone attack, director General of Jammu and Kashmir Police Dilbagh Singh said. The drones were commercially available quadcopters. There were no casualties in the attack but everyone is aware of the potential.

A drone monitoring and jammer system has now been installed at the IAF station in Jammu. Officials said that the anti-drone system, established by National Security Guard, will soon be installed at all vital installations of security forces in Jammu.

The Prime Minister who reviewed the situation arising out of the new development directed the authorities to look into anti-drone systems deployment as a deterrent at the earliest. Indian authorities in recent years have raised the possibility of drone attacks by rebels in the region, especially after repeatedly accusing Pakistan of using China-made drones along the frontier to drop weapons packages for militant groups since last year.

While the Jammu attack was the first such instance in India where a drone was weaponised. The Defence Research and Development Organisation (DRDO) has been asked to develop an anti-drone system by the Prime Minister sometime back and it is evolving a comprehensive system to counter the enemies.

In fact, one such system was deployed in Delhi for Prime Minister Narendra Modi's safety last year during the Republic Day Parade.

According to the DRDO, this technology can bring down micro-drones through either jamming of command and control links or by damaging electronics of drones through laser-based directed energy weapons. "The comprehensive solution is to tackle the problem that drones may pose to national security agencies," DRDO said in a statement.

In addition, this anti-drone technology can detect and jam micro-drones at a distance of up to 3 km and lase a target 1- 1.25 km far depending on the wattage of the laser weapon. The DRDO said that this solution can be an effective counter to increased drone-based activity in India's western and northern sectors. Recently, the Armed Forces proposed arming its 100 Heron drones with missiles to carry out offence.

The Indian Navy has also been cleared to upgrade its existing Unmanned Aerial Vehicles (UAVs) and buy 10 new surveillance drones to closely monitor Indian waters. New age warfare is a must to tackle new age terror tactics. India has to guard itself double against the two major external enemies China and Pakistan who work in tandem always.

<https://www.thehansindia.com/news/national/air-marshal-took-over-as-new-vice-chief-in-indian-air-force-693592?infinitemscroll=1>

DRDO on Twitter





AajTak @aajtak · 14h

DRDO का एंटी ड्रोन सिस्टम कैसे जम्मू जैसे ड्रोन हमलों को रोक सकता है? जानिए DRDO की महानिदेशक जी मंजुला से।

#Khabardar @manjeetnegilive



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दिल्ली: DRDO और L&T द्वारा तैयार किए '12 शॉर्ट स्पैन ब्रिजिंग सिस्टम' को सेना में शामिल किया गया।

सेनाध्यक्ष ने बताया, "आत्मनिर्भर भारत के लक्ष्य की तरफ यह सफल कदम है। इसको बनाने वाले में सभी लोगों की सरहाना करता हूं। इसके सेना में शामिल होने से सेना की ताकत बढ़ेगी।"



10:00 पूर्वाह्न · 2 जुल, 2021



Defence Strategic: National/International



Press Information Bureau
Government of India

Ministry of Defence

Thu, 01 July 2021 6:24PM

Raksha Mantri Shri Rajnath Singh holds virtual interaction with his Vietnamese counterpart;

Both sides agree to enhance engagements between Defence Forces of two countries

Raksha Mantri Shri Rajnath Singh held an online interaction with Minister of National Defence of Vietnam Sr Lt Gen Phan Van Giang on July 01, 2021. During the interaction, both Ministers reviewed the progress on the current initiatives and expressed commitment to further enhance engagements between the Defence Forces of the two countries under the framework of India-Vietnam Comprehensive Strategic Partnership (2016) and under the guidance of the Joint Vision for Peace, Prosperity and People signed during the Virtual Summit between the Prime Ministers of the two countries in December 2020.

Both Ministers acknowledged the significance of the Joint Vision Statement of 2015-20 in strengthening defence cooperation engagements between both the countries thus far and looked forward to concluding the Joint Vision Statement of 2021-25 at the earliest opportunity. The Ministers agreed to initiate measures to enhance cooperation in Defence Industry and Technology domain and look forward to greater synergy in effectively deepening bilateral cooperative engagements across the spectrum. Both Ministers expressed satisfaction at the ongoing activities between the two countries despite the limitations imposed by COVID 19.

In a series of tweets, Shri Rajnath Singh termed the relationship between India and Vietnam as strong & effective. He said “India attaches great importance to its bilateral defence cooperation with Vietnam. Both India and Vietnam share a long-standing tradition of helping each other in difficult times. We have achieved substantial progress in defence industry cooperation in recent years.” The Raksha Mantri added that India and Vietnam continue to make forward movement in overcoming the challenges posed by COVID-19. He thanked Sr Lt Gen Phan Van Giang for inviting him on an official visit to Vietnam, and he looked forward to it.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1731977>



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Thu, 01 July 2021 6:24PM

रक्षा मंत्री श्री राजनाथ सिंह ने वियतनाम के रक्षा मंत्री के साथ वर्चुअल माध्यम से बातचीत की,

दोनों देश रक्षा बलों के बीच द्विपक्षीय सहयोग बढ़ाने पर सहमत

रक्षा मंत्री श्री राजनाथ सिंह ने 01 जुलाई, 2021 को वियतनाम के रक्षा मंत्री सीनियर लेफ्टिनेंट जनरल फान वान गियांग के साथ ऑनलाइन माध्यम से बातचीत की। बातचीत के दौरान दोनों मंत्रियों ने मौजूदा पहलों पर प्रगति की समीक्षा की और भारत-वियतनाम व्यापक रणनीतिक साझेदारी (2016) के ढांचे के तहत और दिसंबर 2020 में दोनों देशों के प्रधानमंत्रियों के बीच वर्चुअल शिखर सम्मेलन के दौरान हस्ताक्षरित 'शांति, समृद्धि और लोगों के लिए संयुक्त दृष्टिकोण' के मार्गदर्शन में दोनों देशों के रक्षा बलों के बीच संबंधों को आगे बढ़ाने की प्रतिबद्धता व्यक्त की।

दोनों देशों के बीच सैन्य सहयोग गतिविधियों को मजबूत करने के लिए संयुक्त नीति रिपोर्ट 2015-20 द्वारा दिए गए महत्व को स्वीकार करते हुए, दोनों मंत्रियों ने संयुक्त नीति रिपोर्ट 2021-25 को जल्द से जल्द पूरा करने की इच्छा व्यक्त की। दोनों मंत्रियों ने रक्षा उद्योग और प्रौद्योगिकी क्षेत्र में गठबंधन को बेहतर बनाने के लिए कदम उठाने पर सहमति जताई और पूरे स्पेक्ट्रम में द्विपक्षीय सहकारी संबंधों को प्रभावी ढंग से मजबूत करने में अधिक तालमेल के लिए तत्पर रहने पर सहमति व्यक्त की। दोनों मंत्रियों ने कोरोना की वजह से आ रही बाधाओं के बीच दोनों देशों के बीच जारी गतिविधियों पर संतोष जताया।

श्री राजनाथ सिंह ने अपने ट्विटर पोस्ट में कहा कि भारत और वियतनाम के बीच संबंध मजबूत और उत्कृष्ट हैं। उन्होंने कहा, "भारत वियतनाम के साथ द्विपक्षीय सैन्य सहयोग को बहुत महत्व देता है। भारत और वियतनाम मुश्किल समय में एक-दूसरे की मदद करने की एक लंबी परंपरा साझा करते हैं। हमने पिछले कुछ वर्षों में रक्षा उद्योग सहयोग में महत्वपूर्ण प्रगति की है।" रक्षा मंत्री ने कहा कि भारत और वियतनाम कोविड चुनौतियों का सामना करते हुए आगे बढ़ते रहेंगे। श्री राजनाथ सिंह ने सीनियर लेफ्टिनेंट जनरल फान वान गियांग को वियतनाम आने के लिए आमंत्रित करने के लिए धन्यवाद दिया और कहा कि वह वियतनाम जाने के लिए उत्सुक हैं।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1732068>



Press Information Bureau
Government of India

Ministry of Defence

Thu, 01 July 2021 6:24PM

Air Marshal BR Krishna AVSM SC assumes the Command of Western Air Command

Air Marshal BR Krishna Ati Vishisht Seva Medal, Shaurya Chakra, took over as Air Officer Commanding-in-Chief (AOC-in-C) of Western Air Command on 01 Jul 21.

The Air Marshal was commissioned in the IAF in Dec 1983 as a Fighter Pilot. In a distinguished career spanning nearly 38 years, the Air Officer, being a Qualified Flying Instructor and an Experimental Test Pilot, has flown a wide variety of fighters, transports and helicopters in the inventory of IAF. He has a flying experience of nearly 5000 hours, including operational, instructional and test flying.

During his illustrious career in the IAF, the Air Officer has held numerous important command and staff appointments. He was Commanding Officer of a frontline fighter Squadron, has commanded Air Force Test Pilots School, Chief Operations Officer of a forward base, Commandant Aircraft & Systems Testing Establishment (ASTE) and has commanded a frontline Fighter base. As an Air Vice Marshal, he held the coveted appointments of Assistant Chief of Air Staff (Projects) and ACAS (Plans) at Air HQ. As an Air Marshal, he served as Senior Air Staff Officer, HQ SWAC and prior to taking over as the AOC-in-C, he held the appointment of Director General Air (Operations) at Air Headquarters. The Air Marshal is an alumnus of National Defence Academy, Defence Services Staff College Wellington and National Defence College.



In recognition of a gallant act in the air, he was awarded Shaurya Chakra in 1986 and for the distinguished service rendered, the Air Marshal was awarded Ati Vishisht Seva Medal in 2017.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1731961>



**Press Information Bureau
Government of India**

Ministry of Defence

Thu, 01 July 2021 2:08PM

Air Marshal Vivek Ram Chaudhari PVSM AVSM VM assumes charge as Vice Chief of The Air Staff

Air Marshal Vivek Ram Chaudhari PVSM AVSM VM took over as the Vice Chief of the Air Staff on 01 Jul 21. The Air Marshal was commissioned in the Fighter stream of the IAF on 29 Dec 82. The Air Officer has a flying experience of more than 3800 hrs on a wide variety of fighter and trainer aircraft, including missions flown during Op-Meghdoot and Op-Safed Sagar.

He is an alumnus of National Defence Academy and Defence Services Staff College, Wellington.

During his illustrious career in the IAF, the Air Officer has commanded a frontline Fighter Sqn and a Fighter base. As an Air Vice Marshal, he has been Deputy Commandant, Air Force Academy, Assistant Chief of Air Staff Operations (Air Defence) and Assistant Chief of Air Staff (Personnel Officers). He has also held the coveted appointments of Deputy Chief of the Air Staff at Air HQ and Senior Air Staff Officer at Eastern Air Command. Prior to assuming the present appointment, he was the Air Officer Commanding-in-Chief of Western Air Command.



He has succeeded Air Marshal HS Arora PVSM AVSM, who retired after more than 39 years of illustrious service on 30 Jun 21. During his tenure as VCAS, he was instrumental in ensuring prompt and optimum operational deployment of assets in proportionate response to the developing situation in Eastern Ladakh. Under his guidance, IAF also effectively contributed towards various HADR and COVID related tasks, both within India and abroad.

On the occasion, the Air Marshals were presented the ceremonial Guard of Honour at Air Headquarters. They also took part in the wreath laying ceremony at the National War Memorial.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1731870>



**Press Information Bureau
Government of India**

Ministry of Defence

Thu, 01 July 2021 5:15PM

Vice Chief of Army Staff visits forward areas in Northern Command

The Vice Chief of Army Staff (VCOAS), Lieutenant General CP Mohanty is on a three day visit to the forward areas in the UT of Jammu and Kashmir of Northern Command to review the prevailing security situation along the Line of Control and the hinterland. During the visit, the Vice Chief of Army Staff is being briefed by formation and unit commanders on the aspects of operational preparedness, infusion of technology and the synergy between various security forces, civil administration and local population. The Army Vice Chief interacted with the troops and emphasised the need to remain alert and be able to respond to any nefarious activities from across the Line of Control and undertaking relentless intelligence based synergised operations to sustain peace in the hinterland. The Vice Chief appreciated the efforts of maintaining a high state of combat readiness despite current COVID-19 pandemic. He reiterated the Indian Army's commitment in the national effort to overcome the challenges of COVID-19 pandemic.



During the last leg of his visit, the Vice Chief, visited Northern Command Headquarters at Udhampur where he was briefed on the complete spectrum of activities undertaken by the Indian Army in the Union Territories of Jammu and Kashmir and Leh. The VCOAS appreciated the synergy fostered between all security agencies especially the cooperation between Northern Command, Air Force, Para Military Forces, Civil Administration and Central Police Organisations operating in the region. The Army Vice Chief exhorted all ranks to continue carrying out their tasks in a professional manner for creating a secure & peaceful environment for ushering in an era of peace and development in the region.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1731949>



**Press Information Bureau
Government of India**

Ministry of Defence

Thu, 01 July 2021 8:26PM

7th Indian Ocean Naval Symposium (IONS)

28 JUN- 01 JUL 21, LA RÉUNION, FRANCE

The 7th edition of Indian Ocean Naval Symposium (IONS), a biennial event, was hosted by the French Navy at La Réunion from 28 June to 01 July 2021. Admiral Karambir Singh, Chief of the Naval Staff, Indian Navy, participated virtually in the inaugural session of the event and provided his congratulatory remarks to the Outgoing and Incoming Chairmen.

IONS, conceived by the Indian Navy in 2008, seeks to enhance maritime cooperation among Navies of the littoral states of the IOR by providing an open and inclusive forum for discussion of regionally relevant maritime issues that would lead to common understanding on the way ahead. The chairmanship of IONS has been held by India (2008-10), UAE (2010-12), South Africa (2012-14), Australia (2014-16), Bangladesh (2016-18) and Islamic Republic of Iran (2018-21). France has assumed the Chairmanship on 29 Jun 21 for a two-year tenure.

During the Symposium, SME presentations were made by French Institute of International Relations - Observatoire du Climat, European Union, Indian Ocean Commission, IFC Singapore, RMIFC Madagascar and EU led Critical Maritime Routes Indian Ocean (CRIMARIO). The Symposium also held panel discussions themed on the three IONS working Groups viz., HADR, Maritime Security and Information Sharing & Interoperability. The Naval Maritime Foundation (NMF) also participated in the Panel Discussion on HADR.

IONS Conclave of Chiefs (CoC) is the decision-making body at the level of Chiefs of Navies, which meets biennially. 6th IONS and CoC was conducted by Iran Navy in April 2018 at Tehran. Owing to the pandemic, the CoC 2021, will be hosted by French Navy later this year.



<https://pib.gov.in/PressReleasePage.aspx?PRID=1732031>

Military should fund its own modernisation

Boosting its capital expenditure does not require a great deal of money

By Ajai Shukla

New Delhi: With thousands of People's Liberation Army (PLA) soldiers infiltrating across the Line of Actual Control (LAC) in Eastern Ladakh last year, the Indian military inched closer to its worst-case security contingency: A two-front confrontation with both China and Pakistan. A combination of hubris and strategic short-sightedness led New Delhi to miscalculate Beijing's response to the dismantling of erstwhile Jammu & Kashmir; and Beijing was further provoked by Home Minister Amit Shah's bluster about regaining the disputed Aksai Chin area. Fortunately, temperatures have cooled somewhat, with a ceasefire in place since February on the India-Pakistan Line of Control (LoC) and the PLA quiet after largely achieving its operational objectives in Ladakh. Even so, with a two-front confrontation likelier today than at the start of 2020, defence planners in New Delhi are experiencing a renewed urgency in the need to modernise India's military.

Year	SLASHING THE BUDGET			(₹ crore)
	Capital budget allocation Projected	Allocated	Shortfall	shortfall (%)
2014-15	1,32,598	84,077	48,521	37
2015-16	1,04,399	86,032	18,367	18
2016-17	1,09,450	78,731	30,719	28
2017-18	1,33,126	78,124	55,002	41
2018-19	1,57,963	83,434	74,529	47
2019-20	1,56,776	92,015	64,761	41
2020-21	1,61,849	1,02,433	59,416	37
2021-22	1,99,553	1,23,000	76,553	38

Source: Parliament figures

The problem, as always, is money. There is a dire shortfall of funds for capital purchases. In all eight budgets presented by the Bharatiya Janta Party government there has been a consistent pattern: Each year, the military calculates its capex requirements for the coming year and projects its requirement to the Ministry of Defence (MoD). The MoD projects this onwards to the Ministry of Finance (MoF). Then, without assigning reasons, the MoF slashes the military's requirement and allocates a smaller capital budget instead.

Governments are entitled to a "peace dividend" when they manage to end conflict. They can reduce defence spending and divert savings to politically rewarding heads such as education, healthcare and subsidies to voters. New Delhi, however, has tried to reap a peace dividend even in troubled times. While preparing the budget for financial year (FY) 2018-19, just months after a serious clash between Indian and PLA soldiers in Doklam, at the China-India-Bhutan border tri-junction, the military projected a capex requirement of Rs 157,963 crore. The MoF unilaterally lopped off 47 per cent (Rs 74,529 crore) and allocated just Rs 83,434 crore. In the current defence budget, which the government presented even as Indian troops were confronting the PLA in Ladakh, the MoF slashed the military's capex projection of Rs 199,553 crore by a whopping 38 per cent (Rs 76,553 crore), allocating just 123,000 crore.

This has been the pattern since 1991-92. Successive governments, featuring political parties of every stripe, have operated on the assumption that a full-scale war was highly unlikely and, therefore, equipment modernisation was wasteful. Border conflicts, such as the 1999 Kargil war, the 2017 Doklam confrontation and the ongoing Ladakh intrusions are not serious enough to make equipment modernisation an imperative. If things go wrong, such as in Kargil where the army was caught without 155-millimetre artillery ammunition for its Bofors guns, we rely on a friend like Israel to bail us out. Meanwhile, the political-electoral calculus favours the spending of thousands of crores on vanity projects such as Sardar Vallabhbhai Patel's statue in Gujarat and the

redevelopment of the Central Vista in New Delhi, over building up our military to be capable and equipped to handle the confrontations and conflicts that loom large in our security matrix.

Boosting the military's capital budget does not require a great deal of money. The revenue heads, which include salaries, pensions and the forces' operating expenses, are already catered for before allocating money to the capital budget head. Therefore, any increase in the defence budget would be an increase in the capital budget. If the current year's defence budget of Rs 478,196 crore were to be increased by Rs 47,000 crore – a 10 per cent increase – this would all be added onto the Rs 137,711 crore capital head, increasing the modernisation budget by an out-of-proportion one-third.

The benefits of such an increase in capital allocations becomes even more apparent when one considers that making a capital purchase usually requires only 10-15 per cent of the total cost to be paid up-front, with the remaining amount disbursed over a five-to-seven year period, as the product is manufactured and delivered. Provided this year's hypothetical capex increase of Rs 47,000 crore is matched by similar increases in following years, the military could immediately conclude defence equipment contracts worth up to Rs 470,000 crore, with Rs 47,000 crore paid as advance this year. In foreign exchange, this \$63 billion would allow the army, navy and air force to fill critical deficiencies in operational equipment such as fighter aircraft, artillery guns and submarines.

The question then is: From where is this annual Rs 47,000 crore to be generated (actually the amount progressively reduces as the defence budget rises in tandem with the Gross Domestic Product)? The choice is between monetising some of the military's existing resources (Ordnance Factories, land banks) on the one hand; and adding a military modernisation cess on the other. For example, Goods and Services Tax (GST) could be increased by one per cent in all slabs as a military modernisation cess. Assuming that economic activity revives and GST collections rise to Rs 120,000 crore per month, a one per cent cess would generate Rs 14,400 crore per year. In addition, the Securities Transaction Tax (STT), levied at the rate of 0.01 per cent, collects some Rs 13,000 crore each year. Doubling STT would yield another Rs 13,000 crore for defence modernisation. Finally, income tax has a three per cent cess for education and one per cent for health, each one per cent amounting to Rs 7,500 crore per year. Much of the education cess reportedly remains unutilised; reducing it by a percentage point and adding a two per cent cess for military modernisation would generate another Rs 15,000 crore.

If increasing taxation is unacceptable, the defence services could monetise some of its 17 lakh acres (2,833 square kilometres) of defence land, which is increasingly a headache for military units and formations to safeguard. Adding annual parcels of defence land to the real estate and housing construction sectors would create the resources for a military modernisation fund, while also boosting economic activity and employment. There are, however, well-justified questions over whether such land sales could ever be kept corruption-free. Even within the military, real estate has created a chequered history of controversies involving senior generals, in land scandals such as the one in Sukhna in 2008 and the Adarsh Housing Society scam in Mumbai in 2011.

That leaves the option of MoD disinvestment in the 41 factories of the Ordnance Factory Board (OFB), which produce arms, ammunition and equipment for the military worth about Rs 12,000 crore annually. Given the OFs' notoriously low productivity and quality, a Group of Ministers is already considering a proposal to "corporatize" them. Merely imposing a corporate structure, however, is unlikely to transform a jalopy into a racehorse and the MoD should consider "privatisation" instead. In the UK, selective privatisation has transformed a moribund public defence sector into vibrant and productive private entities. London has conveyed its willingness to share its experience and expertise with India. This must be explored as a means of raising both capital and productivity.

https://www.business-standard.com/article/opinion/military-should-fund-its-own-modernisation-121070101541_1.html

Working towards preventing drone attacks: Army Chief

Naravane said India is working on both offensive use of drones and counter-drone systems to prevent attacks on critical facilities, like the one in Jammu where two explosive devices were dropped on the IAF station

New Delhi: Days after the drone attack at an Air Force base in Jammu, Army Chief General MM Naravane Thursday said these unmanned aerial vehicles have now become DIY (do-it-yourself) projects that can be easily accessed by state and non-state actors for use in combat.

Naravane said India is working on both offensive use of drones and counter-drone systems to prevent attacks on critical facilities, like the one in Jammu where two explosive devices were dropped on the IAF station.

At a webinar organised by the Global Counter-Terrorism Council, Naravane said: “The character of warfare has been changing continuously, and the advent of drones and counter-drone systems has radically altered the way we think and how we will be having to fight in the future”. He said: “With the ease of availability, drones can be easily accessed and can be used by both state and non-state actors”.



Army Chief Gen MM Naravane. (File)

“We will also have to factor this in as we go along and make our plans. But I would like to assure that we are fully seized of this issue, and are working towards making sure that we are not found wanting in this regard.”

Probed about the topic, the Army Chief said: “In fact you can even make (drones) at home, there is a Do it Yourself (DIY) project, definitely increases the complexity and the challenges that we have to deal with”.

Speaking about the reaffirmation of ceasefire by the Directors General of Military Operations of India and Pakistan in February, he said that the situation in J&K has since seen a “marked improvement”, specially as far as terrorism is concerned.

Naravane said that there has been little or no infiltration from across the Line of Control, and that the number of terror-related incidents in the Valley have also seen a considerable decline.

LAC situation normal

Naravane said the situation along the Line of Actual Control in eastern Ladakh—where India and China have been locked in a military standoff since May 2020—is normal and that talks are going on.

He said that both sides “have strictly adhered in letter and spirit to the disengagement that was agreed upon”.

The last round of diplomatic-level talks were held on June 25. The next round of military-level talks are awaited. China continues to have a small amount of troops on the Indian side of the LAC at Gogra Post and Hot Springs, and is blocking Indian troops access to its five traditional points in Depsang Plains in the north, close to the strategically sensitive Daulat Beg Oldie post of India.

<https://indianexpress.com/article/india/drones-kashmir-indian-army-7384445/>

Scientists advance the understanding of potential topological quantum bits

Quantum computers promise great advances in many fields—from cryptography to the simulation of protein folding. Yet, which physical system works best to build the underlying quantum bits is still an open question. Unlike regular bits in your computer, these so-called qubits cannot only take the values 0 and 1, but also mixtures of the two. While this potentially makes them very useful, they also become very unstable.

One approach to solve this problem bets on topological qubits that encode the information in their spatial arrangement. That could provide a more stable and error-resistant basis for computation than other setups. The problem is that no one has ever definitely found a topological qubit yet.

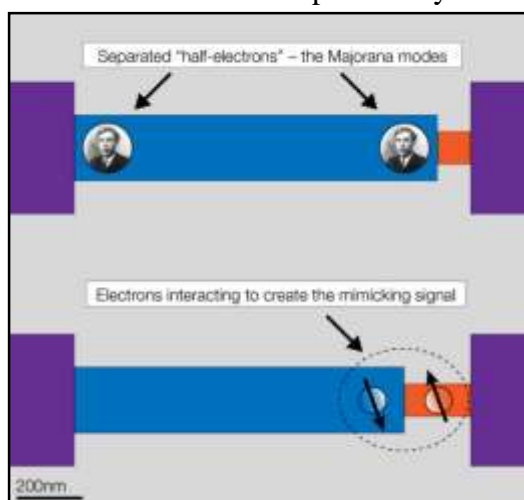
An international team of researchers from Austria, Copenhagen, and Madrid around Marco Valentini from the Nanoelectronics group at IST Austria now have examined a setup which was predicted to produce the so-called Majorana zero modes—the core ingredient for a topological qubit. They found that a valid signal for such modes can in fact be a false flag.

Half of an electron

The experimental setup is composed of a tiny wire just some hundred nanometers—some millionths of a millimeter—long, grown by Peter Krogstrup from Microsoft Quantum and University of Copenhagen. These appropriately-called nanowires form a free-floating connection between two metal conductors on a chip. They are coated with a superconducting material that loses all electrical resistance at very low temperatures. The coating goes all the way up to a tiny part left at one end of the wire, which forms a crucial part of the setup: the junction. The whole contraption is then exposed to a magnetic field.

The scientists' theories predicted that Majorana zero modes—the basis for the topological qubit they were looking for—should appear in the nanowire. These Majorana zero modes are a strange phenomenon, because they started out as a mathematical trick to describe one electron in the wire as composed of two halves. Usually, physicists do not think of electrons as something that can be split, but using this nanowire setup it should have been possible so separate these "half-electrons" and to use them as qubits.

"We were excited to work on this very promising material platform," explains Marco Valentini, who joined IST Austria as an intern before becoming a Ph.D. student in the Nanoelectronics group. "What we expected to see was the signal of Majorana zero modes in the nanowire, but we found nothing. First, we were confused, then frustrated. Eventually, and in close collaboration with our



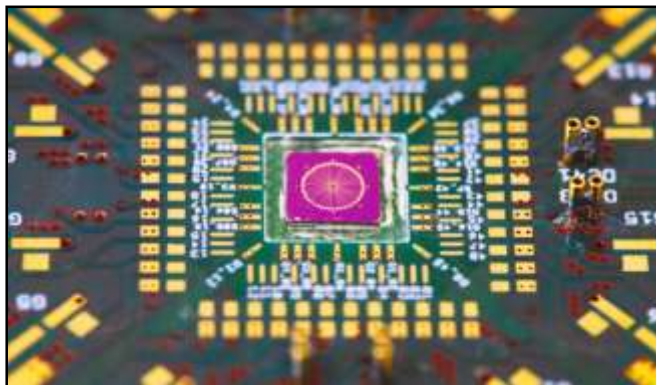
The nanowire is suspended between two metal conductors (purple). The superconductor made of aluminium (blue) covers part of it leaving a gap of exposed inner wire made of indium and arsenic (orange). In the setup with the small junction, the scientists expected to see the separated "half-electrons" in the exposed superconductor -- illustrated by portraits of Ettore Majorana, the Italian physicists for whom they were named. But they did not find anything. In the setup with the big junction, the exposed core of the wire formed a quantum dot and its electrons interacted with the electrons in the superconductor coating forming the mimicking signal. Credit: IST Austria

colleagues from the Theory of Quantum Materials and Solid State Quantum Technologies group in Madrid, we examined the setup, and found out what was wrong with it."

A false flag

After attempting to find the signatures of the Majorana zero modes, the researchers began to vary the nanowire setup to check whether any effects from its architecture were disturbing their experiment. "We did several experiments on different setups to find out what was going wrong," Valentini explains. "It took us a while, but when we doubled the length of the uncoated junction from a hundred nanometers to two hundred, we found our culprit."

When the junction was big enough the following happened: The exposed inner nanowire formed a so-called quantum dot—a tiny speck of matter that shows special quantum mechanical properties due to its confined geometry. The electrons in this quantum dot could then interact with the ones in the coating superconductor next to it, and by that mimic the signal of the "half-electrons"—the Majorana zero modes—which the scientists were looking for.



Printed circuit board for mounting the nanowire sample.
Credit: IST Austria

"This unexpected conclusion came after we established the theoretical model of how the quantum dot interacts with the superconductor in a magnetic field and compared the experimental data with detailed simulations performed by Fernando Peñaranda, a Ph.D. student in the Madrid team," says Valentini.

"Mistaking this mimicking signal for a Majorana zero mode shows us how careful we have to be in our experiments and in our conclusions," Valentini cautions. "While this may seem like a step back in the search for Majorana zero modes, it actually is a crucial step forward in understanding nanowires and their experimental signals. This finding shows that the cycle of discovery and critical examination among international peers is central to the advancement of scientific knowledge."

More information: M. Valentini et al., "Nontopological zero-bias peaks in full-shell nanowires induced by flux-tunable Andreev states," *Science* (2021). science.sciencemag.org/lookup/.../1126/science.abf1513

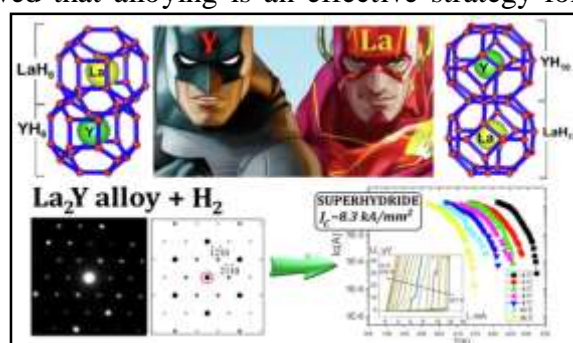
Journal information: [Science](https://doi.org/10.1126/science.abf1513)

<https://phys.org/news/2021-07-scientists-advance-potential-topological-quantum.html>

New ternary hydrides of lanthanum and yttrium join the ranks of high-temperature superconductors

A team led by Skoltech professor Artem R. Oganov studied the structure and properties of ternary hydrides of lanthanum and yttrium and showed that alloying is an effective strategy for stabilizing otherwise unstable phases YH_{10} and LaH_6 , expected to be high-temperature superconductors. The research was published in the journal *Materials Today*.

Cuprates had long remained record-setters for high-temperature superconductivity until H3S was predicted in 2014. This unusual sulfur hydride was estimated to have high-temperature superconductivity at 191–204 K and was later obtained experimentally, setting a new record in superconductivity.



Graphical abstract. *Materials Today* (2021). DOI: 10.1016/j.mattod.2021.03.025

Following this discovery, many scientists turned to superhydrides, which are abnormally rich in hydrogen, and discovered new compounds that became superconducting at even higher temperatures: LaH_{10} (predicted and then experimentally shown to have superconductivity at 250–260 K at 2 million atmospheres) and YH_{10} (predicted to be an even higher temperature superconductor). Despite the similarity between yttrium and lanthanum, YH_{10} proved to be unstable, and thus far no one has succeeded in synthesizing it in its pure form. Having reached the upper limit of critical temperatures for binary hydrides, chemists turned to ternary hydrides which appear as the most promising path towards still higher temperature superconductivity. Finally in 2020, after over 100 years of research, scientists were able to synthesize the first room-temperature superconductor—a ternary sulfur and carbon hydride – with a critical temperature of +15 degrees Celsius.

In their recent work, scientists from Skoltech, the Institute of Crystallography of RAS, and V.L. Ginzburg Center for High-Temperature Superconductivity and Quantum Materials studied ternary hydrides of lanthanum and yttrium with different ratios of these two elements.

"Although lanthanum and yttrium are similar, their hydrides are different: YH_6 and LaH_{10} do exist, while LaH_6 and YH_{10} do not. We found that both structures could be stabilized by adding the other element. For example, LaH_6 can be made more stable by adding 30 percent of yttrium, and its critical superconductivity temperature is slightly higher as compared to YH_6 ," professor Oganov says. In addition, the research has helped to elucidate the general profile of superconductivity in ternary hydrides. "We realized that ternary and quaternary hydrides have progressively less ordered structures and a much greater width of the superconducting transition than binary hydrides. Also, they require more intensive and longer laser heating than their binary counterparts," lead author and Skoltech Ph.D. student Dmitrii Semenov explains.

The scientists believe that the study of ternary hydrides holds much promise for stabilizing unstable compounds and enhancing their superconducting performance.

More information: Dmitrii V. Semenov et al, Superconductivity at 253 K in lanthanum–yttrium ternary hydrides, *Materials Today* (2021). DOI: 10.1016/j.mattod.2021.03.025

Journal information: *Materials Today*

<https://phys.org/news/2021-07-ternary-hydrides-lanthanum-yttrium-high-temperature.html>

Non-stop signal achieved in high-power Erbium-doped mid-infrared lasers

By Zhang Nannan

The Mid-infrared lasers (MIR) with high peak power and high repetition rate operating in the range of 2.7~3 μm have important application in laser surgery and optical parametric oscillator (OPO).

A recent study conducted by Sun Dunlu's research group at the Hefei Institutes of Physical Science (HFIPS) of the Chinese Academy of Sciences (CAS) achieved high power, high efficiency and quasi-continuous mid-infrared laser in the free running and langasite [$\text{La}_3\text{Ga}_5\text{SiO}_{14}$ (LGS)] Q-switched modes by using the Er^{3+} ions-doped YAP crystals as laser gain medium.

Based on their previous research work on laser, the researchers further improved the laser performance of Er:YAP laser crystal by laser-diode (LD) side-pumping method, a Er:YAP crystal rod with concave end-faces was used to compensate the thermal lensing effect. The maximum output powers of 26.75 W were achieved at 250 Hz, and 13.18 W at 1000 Hz, which is the highest working frequency in all the LD side-pumped Er-doped MIR laser so far.

In addition, they demonstrated a LD side-pumped and electro-optical Q-switched Er,Pr:YAP laser with emission at 2.7 μm . A giant pulse laser was obtained with pulse energy of 20.5 mJ, pulse width of 61.4 ns, and peak power of 0.33 MW at the highest working frequency of 150 Hz.

These results indicate that the Er^{3+} -doped YAP crystals are promising candidate for the high power and high frequency mid-infrared laser device, which possess great potential for the application of dental ablation surgery and OPO pump source.

More information: Cong Quan et al, 13-W and 1000-Hz of a 27- μm laser on the 968 nm LD side-pumped Er:YAP crystal with concave end-faces, *Optics Express* (2021). DOI: [10.1364/OE.428874](https://doi.org/10.1364/OE.428874)

Cong Quan et al, Performance of a 968-nm laser-diode side-pumped, electro-optical Q-switched Er,Pr:YAP laser with emission at 2.7 μm , *Optical Engineering* (2021). DOI: [10.1117/1.OE.60.6.066112](https://doi.org/10.1117/1.OE.60.6.066112)

Journal information: [Optics Express](https://www.opticsexpress.net)

<https://phys.org/news/2021-07-non-stop-high-power-erbium-doped-mid-infrared-lasers.html>

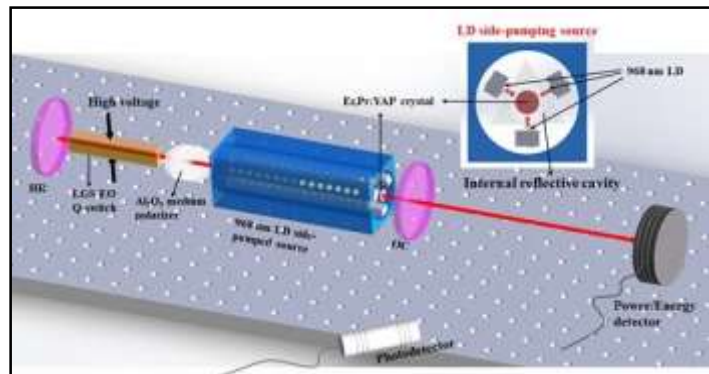


Fig. 1. Schematic of LD side-pumped Er(Pr):YAP laser. Credit: QUAN Cong

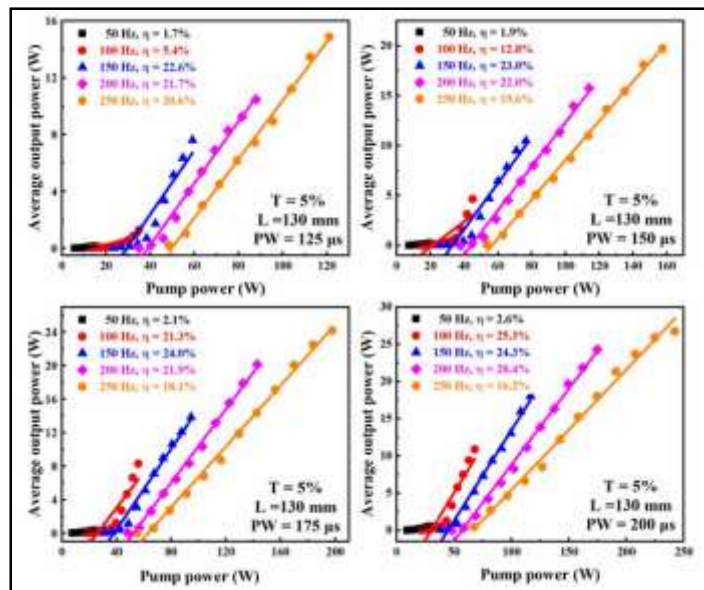


Fig. 2. Average output power of LD side-pumped Er:YAP laser versus pump power at different working frequencies and pump pulse widths. Credit: QUAN Cong

Study identifies risk factors for severe COVID-19 in individuals with sickle cell disease

Researchers urge high-risk patients to get COVID-19 vaccine

Summary:

New research finds that certain factors, such as a history of severe pain episodes and coexisting organ conditions, increase the risk of severe COVID-19 illness, including hospitalization, in individuals living with sickle cell disease (SCD). According to researchers, the study results underscore the need for COVID-19 risk reduction strategies and vaccination for this medically vulnerable population.

New research published today in the journal *Blood Advances* finds that certain factors, such as a history of severe pain episodes and coexisting organ conditions, increase the risk of severe COVID-19 illness, including hospitalization, in individuals living with sickle cell disease (SCD). According to researchers, the study results underscore the need for COVID-19 risk reduction strategies and vaccination for this medically vulnerable population.

SCD is the most common inherited red blood cell disorder in the United States, affecting an estimated 100,000 people. According to the Centers for Disease Control and Prevention, SCD affects one out of every 365 Black or African American births and one out of every 16,300 Hispanic American births. The condition can cause severe pain, joint and organ damage, and stroke; these conditions predispose individuals with SCD to worse outcomes with infections, including infection with COVID-19. Previous research has shown patients with COVID-19 and SCD are at greater risks for hospitalization compared with Black individuals without SCD who become infected.

The new study draws data from SECURE-SCD, an international registry that collects information about COVID-19 infections in individuals living with SCD, including details on hospitalization, severity, management strategies, and complications.

Researchers assessed reports on 750 children and adults submitted to the registry between March 2020 and March 2021. Half the patients they studied were children aged 18 and under, and half were adults with a median age of 31 years old. Ninety percent of participants were identified as Black and 7% as Hispanic or Latino.

The researchers found that children living with SCD who had previously suffered more than two pain events requiring acute care were 2.2 times more likely to be hospitalized for COVID-19 and more than 3 times likely to suffer severe COVID-19 illness. A history of pain events was also found to be a risk factor for adults, as those with more than two prior acute care visits for pain were 1.8 times more likely to be hospitalized with COVID-19 and 1.9 times more likely to suffer severe COVID-19 illness. SCD-related heart, lung, and kidney conditions were associated with higher risk of severe illness in children, while SCD-related heart and lung conditions were also associated with higher risk of hospitalization. However, these conditions did not have the same effect in adults.

"This study tells us that all individuals with sickle cell disease are not at equal levels of risk," said study author Lana Mucalo, MD, of the Medical College of Wisconsin. "Patients with a history of pain, as well as individuals with coexisting organ conditions, need to be even more careful to avoid COVID-19 infection than those without any comorbidities," said Dr. Mucalo.

Dr. Mucalo also noted that now that COVID-19 vaccines are available, physicians and patients alike need to recognize these risk factors when considering vaccination. "Providers that care for individuals living with sickle cell disease should recommend vaccination, particularly for those with these comorbidities that put them at greater risk."

Pain is the most common complication of SCD, and severe pain is the leading cause of emergency department visits and hospitalizations for people with this disease. Notably, this study found that pain was also the most common presenting symptom during COVID-19 illness in both children and adults living with SCD, and that many patients only had pain as their presenting COVID-19 symptom. "This means individuals with sickle cell disease who come to the hospital presenting with pain should also be tested for COVID-19," said Dr. Mucalo.

The research team also sought to understand the effects of hydroxyurea, a drug commonly prescribed to individuals with SCD to reduce the frequency of pain episodes, on COVID-19. About half of the 750 patients studied were taking hydroxyurea, and the researchers found that hydroxyurea use was associated with lower risk of presenting with pain during COVID-19 in adults living with SCD. However, hydroxyurea did not affect whether an individual would develop a serious case of COVID-19 or need to be hospitalized in children or adults.

"Early in the COVID-19 pandemic, physicians were worried about whether to use hydroxyurea simply because we did not yet know the effects," said Dr. Mucalo. "Now we can see that while it does not affect COVID-19 severity, it does help to lower the incidence of pain episodes in adults with sickle cell disease, so those who are using it for treatment of their sickle cell conditions should not stop using it."

The analysis was limited to patient data reported to SECURE-SCD; given the voluntary reporting system of the registry, it does not capture all known cases of patients with sickle cell disease and COVID-19 infection.

SECURE-SCD is supported by Doris Duke Charitable Foundation.

Journal Reference:

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<https://www.sciencedaily.com/releases/2021/07/210701120659.htm>

