Nov
2021

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खंड : 46 अंक : 226 12 नवम्बर 2021

Vol. : 46 Issue : 226 12 November 2021

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The EurAsian Times

Fri, 12 Nov 2021

India's much-fancied LCA Tejas Fighter Jets arrive for Dubai Air Show; Globemaster, Super Hercules join the IAF Gang

Aashish Dangwal

One of the most awaited Airshows of the year is approaching and it will be particularly significant for fighter jet lovers as Indian Air Force will display its indigenous Light Combat Aircraft (LCA) Tejas at the biennial Dubai Air Show.

Three LCA Tejas from Indian Air Force's 18 Squadron land at Dubai to take part in Dubai Air Show-2021: Hindustan Aeronautics Limited (HAL)

The Indian Air Force's indigenously built fighter aircraft HAL Tejas will demonstrate its spectacular aerial acts at the five-day Dubai Air Show, which begins from November 14 at Al Maktoum International Airport.

The IAF had earlier received an invitation from the UAE government to participate in the air show. The UAE Armed Forces' Staff Maj Gen Staff Pilot Ishaq Saleh Mohammed al-Balushi and other officers of the UAE Air Force warmly welcomed the IAF contingent upon their arrival.

The Indian aerial aerobatics team called Suryakiran will also make its debut at this international air show. While the Sarang Team has participated in the Al Ain Grand Prix in the UAE in 2005, the Dubai Air Show will be the first opportunity for the Suryakirans and the Tejas to show off their aerial maneuvers here, the statement added.

The induction of five Advanced Light Helicopters (ALH) Dhruvs of the Sarang Team, 10 BAE Hawk 132s of the Suryakiran Team and the three LCA Tejas was completed by November 09. The induction was supported by the IAF's C-17 Globemaster IIIs and C-130J Super Hercules transport aircraft," the IAF stated.

This will be the Tejas aircraft's fourth flight outside of the country, having previously performed at the Air Show in Sri Lanka in 2021, the Bahrain International Air Show in 2016, and the Langkawi International Maritime Aero Expo (LIMA-2019) in Malaysia.

Indian Tejas Aircraft

The HAL Tejas is a single-engine multirole light fighter developed for the Indian Air Force by the Aeronautical Development Agency in collaboration with the Aircraft Research and Design Centre of Hindustan Aeronautics Limited.

Earlier this year, the Hindustan Aerospace Limited (HAL) inked a $6.58 billion deal to produce 73 new Tejas Mark 1A Light Combat Aircraft jets and 10 Tejas Mark 1 two-seat training jets to the Indian Air Force during a ceremony at Yelahanka air base in Bangalore.

The order, which obtained preliminary clearance from the government in January, falls short of the projected request for 83 Mark 1As and 18 trainers.

It adds to the Indian Air Force's initial purchase for 40 base Mark 1 models (including eight trainers), which is about halfway completed. Mark1 type is managed and operated by one squadron, the No. 45 Flying Daggers.

HAL has struggled to boost annual Tejas jet deliveries, but due to outsourcing and the development of a second production line, this is expected to grow to 16 per year in 2021. The Mark 1A is scheduled to fly for the first time in late 2022 or early 2023.

India is also working on the MK2 version of the Tejas jet. The aircraft had recently grabbed global eyeballs when the Indian Air Force chief stated that seven squadrons of the Tejas Mk-2 are projected for induction into the service in the coming years.

Currently, the Tejas Mk-2 fighter jet is in the Critical Design Review (CDR) phase, which involves multi-disciplinary technical review to ensure that a system can proceed to fabrication, demonstration, and testing to meet desired performance standards while keeping up with the schedule and cost restrictions.

Earlier, HAL chairman R Madhavan had said the MK-2 variant would be much superior to Tejas Mark-IA, 73 of which are being procured by the Indian Air Force from the HAL under Rs 48,000 crore deal that was approved by the government on January 13, 2021, according to PTI.

Dubai Air Show

The Dubai Airshow will be open to aerospace and defense exhibitors as well as for spectators from November 14 to 18. Tarsus F&E LLC Middle East is hosting the expo, which will feature more than 20 country pavilions, 160 aircraft displays, and over 1,200 exhibitors.

The event will promote the UAE's 'Make It In The Emirates' program by demonstrating UAE entities' services to worldwide professionals and industry leaders, as well as fostering collaboration between different parties.

Israel, the Czech Republic, Australia, and Belgium all reserved pavilions for the first time. Israel's participation in the Airshow comes after the signing of the Abraham Accords, which is attempting to improve diplomatic relations with all its neighbors.

The inclusion of Israel's Rafael Advanced Defense Systems (RADS) and Elbit Systems, Singapore's Kelley Aerospace, American firms Accenture and M4 Engineering, European firm Eurosam, and Emirati firms NAFFCO and G42 is also noteworthy this year.

As per Organizers, this year will debut the brand-new conference platform TechXplore, which will demonstrate how technology is assisting to reboot aviation and transform the overall flying experience.

The dedicated startup event VISTA, co-hosted by Boeing and AE Industrial Partners, is another new addition. VISTA, according to show organizers, is the "ultimate venue for innovators, creators, and market disruptors to showcase the latest technology and play a significant role in pushing the future of the aerospace and defense industries."

Product pitching contests will also be hosted under this initiative in collaboration with government and industry partners such as Etihad Airways, the Mohammed Bin Rashid Space Centre, Amazon Web Services, and Boeing's applied innovation team.

https://eurasiantimes.com/india-lca-tejas-fighter-jets-arrive-for-dubai-air-show/

THE HINDU

Fri, 12 Nov 2021

Union Minister visits NPOL

Kochi: Union Minister of State for Electronics and Information Technology, Skill Development and Entrepreneurship, Rajeev Chandrasekhar, on Thursday visited the Naval Physical Oceanographic Laboratory (NPOL), a DRDO laboratory, which works in the field of underwater surveillance systems and technologies.

Vijayan Pillai, director of the lab, brief him on the establishment's roadmap for the next 20 years. Mr. Chandrasekhar also visited the acoustic tank facility and the DARPAN facility, a sonar design and simulation centre equipped with oceanographic and sonar signal database which can evaluate advance signal processing algorithms.

https://www.thehindu.com/news/cities/Kochi/union-minister-visits-npol/article37446989.ece

THE HANS INDIA

Fri, 12 Nov 2021

NSTL celebrates 'World Quality Day-2021'

Highlights

As a part of the 'Azadi Ka Amrit Mahotsav', Defence Research and Development Organisation (DRDO)/ Naval Science & Technological Laboratory (NSTL) celebrated 'World Quality Day-2021' here on Thursday.

Visakhapatnam: As a part of the 'Azadi Ka Amrit Mahotsav', Defence Research and Development Organisation (DRDO)/ Naval Science & Technological Laboratory (NSTL) celebrated 'World Quality Day-2021' here on Thursday.

Focusing on the theme, 'Sustainability: Improving our Products, People and Planet', the event aimed at raising the level of quality awareness and recognising efforts and contribution of quality professionals. The celebrations saw distinguished scientist and director general (Naval Systems and Materials) Samir V Kamat participating as chief guest. Speaking on the occasion, he said sustainability can be achieved by giving quality solutions for the lifecycle and recycling issues of any developed system.

Outstanding scientist and director, NSTL, Y Sreenivas Rao said in his address that the theme reminds NSTL personnel the importance of quality towards attaining sustainability in all phases of system development. He said that long-term sustainability can be achieved with consistent efforts and by habituating quality culture in the organisation.

The event included three lectures delivered by Cmde RK Jena, chief inspector of Naval Armaments (East), rear admiral S Misra, ex-director general of naval armaments inspection (DGNAI), DRDO fellow and A Srinivas Kumar, outstanding scientist and technology director (Batteries and Explosives).

Prizes were distributed to the winners of the quiz contest. Senior scientists, officers, members of NSTL Civil Employees Union and Works Committee and staff of NSTL participated in the event.

https://www.thehansindia.com/news/cities/visakhapatnam/nstl-celebrates-world-quality-day-2021-714923

Defence News

Defence Strategic: National/International

Press Information Bureau
Government of India

Ministry of Defence

Thu, 11 Nov 2021 6:37PM

Nepal to establish its own National Defence University on the lines of NDC, says Nepal Army Chief

Army Chief of Nepal General Prabhu Ram Sharma who has been conferred with the Honorary rank of 'General' of the Indian Army unveiled his portrait on the 'Wall of Honour' and was presented with the 'Scroll of Honour on November 11, 2021 at National Defence College (NDC) in New Delhi. Prominent alumni of the NDC, who have risen to the highest ranks in their respective countries are honoured with the special recognition. General Sharma belongs to the 53rd NDC Course.

In his address, General Sharma lauded the NDC for commitment to the highest standards of professional and academic insights and shaping him to become an able candidate to this honour. He also mentioned that Nepali Army is embarking on the journey to establish its own National Defence University and the areas of cooperation have been extended even further.

Earlier, as part of outreach programme, Defence Secretary Dr Ajay Kumar inaugurated NDC alumni web portal and released inaugural issue of NDC Alumni newsletter at the institution. This will provide an excellent opportunity for the alumni to connect, share and engage with the NDC and thereby strengthen the relationships with friendly foreign countries.

https://pib.gov.in/PressReleasePage.aspx?PRID=1771015

पत्र सूचना कार्यालय
भारत सरकार
रक्षा मंत्रालय

Thu, 11 Nov 2021 6:37PM

नेपाल एनडीसी की तर्ज पर अपना राष्ट्रीय रक्षा विश्वविद्यालय स्थापित करेगा: सेना प्रमुख, नेपाल

नेपाल के सेना प्रमुख जनरल प्रभु राम शर्मा, जिन्हें भारतीय सेना के मानद 'जनरल' पद से सम्मानित किया गया है, ने 'वॉल ऑफ ऑनर' पर अपने चित्र का अनावरण किया और उन्हें 11 नवंबर, 2021 को राष्ट्रीय स्तर पर नई दिल्ली में डिफेंस कॉलेज (एनडीसी) में 'स्क्रॉल ऑफ ऑनर' से सम्मानित किया गया। एनडीसी के ऐसे प्रमुख पूर्व छात्र, जो अपने-अपने देशों में सर्वोच्च रैंक तक पहुंचे हैं, उन्हें विशेष मान्यता से सम्मानित किया जाता है। जनरल शर्मा 53वें एनडीसी कोर्स से संबंधित हैं।

अपने संबोधन में जनरल शर्मा ने पेशेवर और अकादमिक अंतर्दृष्टि के उच्चतम मानकों के प्रति प्रतिबद्धता और उन्हें इस सम्मान के लिए एक सक्षम उम्मीदवार बनने के लिए आकार देने के लिए एनडीसी की सराहना की। उन्होंने यह भी उल्लेख किया कि नेपाली सेना अपना राष्ट्रीय रक्षा विश्वविद्यालय स्थापित करने के सफर पर है साथ ही सहयोग के क्षेत्रों को और भी आगे बढ़ाया गया है।

इससे पहले आउटरीच कार्यक्रम के अंतर्गत रक्षा सचिव डॉ. अजय कुमार ने एनडीसी के पूर्व छात्रों से जुड़े वेब पोर्टल का उद्घाटन किया और संस्थान में एनडीसी पूर्व छात्र न्यूजलेटर का उद्घाटन अंक जारी किया। यह पूर्व छात्रों को एनडीसी के साथ जुड़ने, साझा करने और जुड़ने का एक उत्कृष्ट अवसर प्रदान करेगा और इस तरह मित्र देशों के साथ संबंधों को मजबूत करेगा।

https://pib.gov.in/PressReleasePage.aspx?PRID=1771053

Fri, 12 Nov 2021

For the third time, Defence Ministry extends emergency powers granted to Army, Navy, IAF to procure ammunition

Amid tensions with China at the LAC, the Defence Ministry also stressed on the need to strengthen the existing procurement processes instead of frequently invoking emergency powers

By Amrita Nayak Dutta

The Defence Ministry has once again extended the emergency powers accorded to the Army, Navy, Air Force and the Integrated Defence Staff (IDS) for urgent revenue procurements and works amid continuing tensions with China along the Line of Actual Control (LAC) in eastern Ladakh, even as the ministry emphasised strengthening the existing rules of procurement, News18.com has learnt.

According to defence sources, emergency powers for revenue procurements through fast-track process have been extended for three more months till December 31. This is the third extension of emergency powers granted for revenue procurements since last year when they were first invoked. While they were first extended till March from December last year, they were again extended till August this year.

Capital procurements refer to purchase of weapons or weapon systems and other critical equipment, while revenue procurements include purchase of ammunition and spares to keep these assets running. (Representative image/Reuters)

No extension was, however, granted to the emergency powers accorded to the three services for capital procurements.

As per top defence sources, the ministry has also stressed on the need to strengthen the existing procurement processes under the Defence Acquisition Procedure (DAP) for capital procurements and Defence Procurement Manual (DPM) for revenue procurements, instead of frequently bringing in emergency powers for urgent procurements.

“In fact, Defence Minister Rajnath Singh has sought further fine-tuning of all rules for capital and revenue procurements,” a defence source said.

The emergency revenue procurement powers were delegated under the respective Army, Navy, Air Force and Integrated Defence Staff Schedule of Powers under the revised Delegation of Financial Powers to Defence Services (DFPDS-2021) unveiled by Rajnath Singh in September this year.

This will give the vice-chiefs of the three services and the chief of the Integrated Defence Staff to the Chairman Chiefs of Staff Committee (CISC) emergency powers to procure ammunition, vehicles, stores, specialised services as well as equipment and machinery of up to Rs 500 crore for different exercises and operations.

“The long procurement process will be cut short under the emergency powers, thus aiding faster procurement of spares and various other items required to maintain the assets deployed in the forward locations,” a source said.

The delivery period for such procurements will be within one year from the date of signing the contract.

A senior defence official explained that the service chiefs or the CISC will be authorising the equipment and their quantities to be procured under these powers based on operational requirements. “These powers will help the services meet the critical capability voids — essential in the backdrop of tensions with China — and help in faster signing of the contracts which are in the advanced stages of procurement,” the official said.

A second defence official said that the service headquarters were also told to provide the list of items they had sought to procure under these powers to the Department of Military Affairs, including the details of the contracts signed and the deliveries received.

Additionally, Rajnath Singh was also given a presentation last month by the services over what has been procured under the emergency powers, the items which are scheduled to be procured and the various cases of delays in procuring certain critical items.

Major procurements amid LAC standoff

While capital procurements refer to purchase of capital assets, weapons or weapon systems and other critical equipment, revenue procurements include purchase of ammunition and spares to keep these assets running.

The Defence Ministry, for the first time, had given emergency capital procurement powers to the three services for procurements of up to Rs 300 crore after the Galwan Valley clashes last year, even as emergency powers for revenue procurements were granted to them after the Balakot airstrike in February 2019 and the Uri surgical strike in 2016.

As per sources, a number of spares and other essential items have been bought under the emergency powers, much of it for the construction of habitat, roads and bridges in eastern Ladakh.

Anti-drone systems, another set of Highly Agile and Manoeuvrable Munition Extended Range (HAMMER) air-to-ground precision-guided weapon system for Rafale fighter jets feature among the capital procurements made using emergency powers.

Man Portable Air Defence System (MANPADS), a set of Israeli SPICE bombs and Heron drones, and T-72 and T-90 main battle tanks’ ammunition were other major capital purchases initiated.

https://www.news18.com/news/india/emergency-powers-granted-to-army-navy-iaf-to-procure-ammo-extended-for-third-time-amid-lac-tensions-4433312.html

REPUBLICWORLD.COM

Fri, 12 Nov 2021

Rajnath Singh Meets Nepal's Army Chief; Discusses Bilateral Defence & Security Cooperation

Defence Minister Rajnath Singh met with Nepal's Chief of Army Staff General and discussed matters related to bilateral defence and security cooperation

By Bhavya Sukheja

Defence Minister Rajnath Singh on Thursday, 11 November, met with Nepal's Chief of Army Staff General Prabhu Ram Sharma, a day after the latter was conferred the honorary rank of 'General of the Indian Army' by President Ram Nath Kovind. While taking to Twitter, the Office of Raksha Mantri informed about the meet and also stated that the two discussed matters related to bilateral defence and security cooperation.

It is to mention that General Sharma is currently on a four-day visit to India in a bid to explore ways to further deepen defence cooperation between the two nations. According to PTI, Defence Ministry officials said that matters relating to bilateral defence and security cooperation were figured in the meeting between Rajnath Singh and General Sharma.

Earlier on Thursday, External Affairs Minister (EAM) S Jaishakar also met General Sharma. The EAM said that Nepal's Chief of Army Staff's visit underlines the closeness of the relationship between New Delhi and Kathmandu.

Nepal's Army Chief's visit to India

Nepal's Army Chief has already held talks with Chief of Defence Staff General Bipin Rawat, General Naravane and Chief of Air Staff Air Chief Marshal Vivek Ram Chaudhari in the last couple of days. In continuation of a tradition that started in 1950, General Sharma was conferred with the honorary rank of 'General of the Indian Army' by President Ram Nath Kovind on Wednesday. Last year, Nepal too had conferred the honorary rank of 'General of Nepal Army' to India Army Chief General MM Navarane during his visit to Kathmandu.

General Sharma arrived on a four-day visit to India at the official invitation of Chief of Army Staff, General Naravane. During his visit to India, General Sharma met his Indian counterpart in New Delhi on Tuesday, 9 November. The chief of Army staff of both the nations discussed bolstering "defence cooperation" between Nepal and India. On his arrival at South Block, General Prabhu Ram Sharma was given a warm welcome by General MM Naravane.

https://www.republicworld.com/world-news/rest-of-the-world-news/rajnath-singh-meets-nepals-army-chief-discusses-bilateral-defence-and-security-cooperation.html

THE HINDU

Fri, 12 Nov 2021

Vice Admiral A.K. Chawla visits INS Agrani

Coimbatore: Vice Admiral A.K. Chawla, Flag Officer Commanding-in-Chief, Southern Naval Command (SNC), visited INS Agrani, the Leadership and Management Training Establishment of the Indian Navy, here on Thursday.

The SNC chief received the guard of honours and reviewed the training infrastructures of the establishment.

He inaugurated the in-living accommodation-cum-recreation complex 'Noyyal' and the station waste management plant *Pazhamudir Thottam*.

With the launch of the waste management plant, INS Agrani will become an almost zero waste generation base, said a press release.

He also interacted with the naval personnel, including defence civilian employees. He highlighted the important role played by the unit in imparting leadership and management skills to the sailors of the Indian Navy, the release said.

The SNC chief was accompanied by Sapana Chawla, president of Navy Wives' Welfare Association (NWWA), Southern Region. Ms. Chawla inaugurated the health park 'Oasis' in Naval Officers Enclave. She also interacted with the ladies of the station.

https://www.thehindu.com/news/cities/Coimbatore/vice-admiral-ak-chawla-visits-ins-agrani/article37447330.ece

ThePrint

Fri, 12 Nov 2021

Army turns its focus to flying arm, sets up 3 integrated Aviation Brigades amid tensions at LAC

The Aviation Corps will see expansion in the coming months with induction of drones, light combat helicopters, Apache attack choppers & replacements for Cheetah and Chetak helicopters.

By Snehesh Alex Philip, Edited by Neha Mahajan

New Delhi: As tensions with China continue to simmer along the Line of Actual Control (LAC), the Indian Army is focusing on increasing its surveillance and move capability and is in the process of revamping its Aviation Corps, ThePrint has learnt.

An Indian Army soldier at LAC in Arunachal Pradesh | Nirmal Poddar | ThePrint

Sources in the defence and security establishment said the Army has set up three integrated Aviation Brigades, two of which are along the LAC.

While a new Aviation Brigade has come up under the Eastern Command, as reported by ThePrint last month, two more have been set up under the Northern and the Western Command as part of the new Order of Battle (ORBAT).

"These new Aviation Brigades are part of the rebalancing

that the Army has been doing. This ensures that there is a more coordinated and localised control of the aviation assets," a source explained.

Also, all drones operations have now been moved to the Aviation Corps from the Artillery which used to be in charge of Unmanned Aerial Vehicles (UAVs) as part of the revamp.

These Aviation Brigades have been set up along with integrated surveillance and operations centres that continue to monitor sensitive areas round the clock, not just through the feed sent in by the drones and the helicopters but also the satellites.

Sources said a need was felt to have a more coordinated round-the-clock surveillance capability rather than just boots on the ground.

"Aviation is an integral part of the warfighting process. Better surveillance capability, advance knowledge of enemy movement and faster mobilisation is key to fighting a war," a second source said.

Multiple forward helicopter bases have been set up along the LAC which enables the force with more options, not just for surveillance but also for troops insertion and movement of logistics.

The Army is also in the process of procuring new-age portable helipads that are user-friendly, ruggedized with scope for modularity.

Revamp of Army Aviation Corps

As part of its revamp, all drones operated by the Army have been moved to the Aviation Corps from the Artillery.

"Drone warfare is the future. The Army has just ordered for swarm drones, both for logistics and attack. The Army has also ordered kamikaze drones while also buying four new satellite link-enabled long range surveillance drones from Israel. In the future, you will see a large variety of drones being procured by the Army and hence it was important that the Aviation Corps takes care of them rather than the artillery because drone warfare has changed," the second source said.

Sources said the Aviation Corps will see a huge expansion in the coming months as the force was focusing on induction of light combat helicopters, the Apache attack choppers and replacements for the Cheetah and Chetak helicopters.

"What has happened during the current crisis with China is that the Army is ensuring that all its helicopter squadrons are fully equipped with the sanctioned numbers. So more helicopters have been sent to the critical areas and these include the Dhruv Advanced Light Helicopters (ALH) and its armed version, the Rudra," a third source said.

Sources also said the Army has focused on the move capability, transfer of soldiers from one sector to another since the tensions began at the LAC last year.

Deployment of more Rudra helicopters has come as a boon for the Army. This is because the Army can carry out operations in the high altitude regions close to the LAC through Dhruv helicopters with the protective cover of Rudra.

"Our training has focused on heliborne insertion of troops at high altitudes which enables quick transfer of soldiers from one valley to another. We are doing it at our own level as well as with the IAF," a fourth source said.

https://theprint.in/defence/army-turns-its-focus-to-flying-arm-sets-up-3-integrated-aviation-brigades-amid-tensions-at-lac/764413/

INDIA TODAY

Fri, 12 Nov 2021

Lt Gen Anindya Sengupta to be Indian Army's next 'Fire and Fury' Corps Commander

Lt Gen Anindya Sengupta will be the Indian Army's next 'Fire and Fury' Corps Commander in Ladakh

By Manjeet Negi

New Delhi: Amid the ongoing military standoff with China, Lieutenant General Anindya Sengupta will be the new commander of the Leh-based 'Fire and Fury' Corps by the end of this month.

He will succeed Lt Gen PGK Menon, who is completing his tenure of more than a year and has represented India in the talks with China to resolve the ongoing standoff in Eastern Ladakh on multiple occasions.

Lt Gen Anindya Sengupta will take over as the next commander of the Fire and Fury Corps (Photo: ANI)

"Lt Gen Sengupta is going to take over as the next commander of the Fire and Fury Corps and would be heading the talks from the Indian side with the Chinese in the next round of talks," top government sources told India Today.

Due to the sensitive nature of the corps, which guards both the Chinese and Pakistani borders, the new corps commander will spend about 15 days with his predecessor to understand every aspect of the area and the issues that arise from it.

The Corps is also in charge of the Siachen area, which has been the world's highest and coldest battlefield for more than three decades.

India and China have been in a military standoff position for almost two years now.

China has deployed over 60,000 troops in areas bordering India and is rapidly constructing infrastructure. India had also made similar deployments and had deployed heavy weaponry to counter their aggression.

Lt Gen Sengupta is currently posted in the Army Headquarters. Prior to joining Army headquarters, he served in the Punjab Regiment and commanded a counter-terrorist force in the Kashmir valley.

https://www.indiatoday.in/india/story/anindya-sengupta-indian-army-next-fire-and-fury-corps-commander-1875709-2021-11-11

THE HANS INDIA

Fri, 12 Nov 2021

Karnataka makes strong pitch for defence, aerospace sectors

Highlights

Making a strong pitch for investments in defence and aerospace sector, Large and Medium Industries Minister Murugesh Nirani on Thursday announced that the Karnataka government is planning to offer enhanced incentives to MSMEs to provide a level playing field and make them competitive as part of the new Aerospace and Defence policy.

Bengaluru: Making a strong pitch for investments in defence and aerospace sector, Large and Medium Industries Minister Murugesh Nirani on Thursday announced that the Karnataka government is planning to offer enhanced incentives to MSMEs to provide a level playing field and make them competitive as part of the new Aerospace and Defence policy.

Karnataka makes strong pitch for defence, aerospace sectors

He said the new policy will be introduced as part of the government's "proactive approach to update our policy to provide a key push for this important sector," according to a press note released on Thursday. Nirani added that the government is also in the process of setting up a 1,200-acre defence and aerospace park in Devanahalli, which may also be officially announced at the end of December. The new policy would concentrate on drawing Original Equipment Manufacturers (OEM) to the state and the state government is looking to create clusters not only in Bengaluru but other parts of the state like Tumkuru where the helicopter complex under Hindustan Aeronautics Limited (HAL) is coming up, Chamarajnagar and even Chitradurga which is turning into an important hub for units of the Defence Research and Development Organisation (DRDO).

Karnataka positioned itself as a prime location for aerospace & defence industry in India. Establishment of institutions and PSUs like HAL, NAL, DRDO, ISRO and IISc created a strong ecosystem and as a result over the years, leading global players have set up their shops in the state.

Nirani, meanwhile, noted that Karnataka is already leading the realm when it comes to a strong industrial base. "Our Gross State Domestic Product (GSDP) is approximately Rs 17 lakh crore and accounts for the highest total exports among all states in India," he said.

Elaborating on the state's predominant position in the defence and aerospace sector, the minister said 25 per cent of India's aircraft and spacecraft industry is based in Karnataka.

https://www.thehansindia.com/news/cities/bengaluru/karnataka-makes-strong-pitch-for-defence-aerospace-sectors-714948

TheDefensePost

Fri, 12 Nov 2021

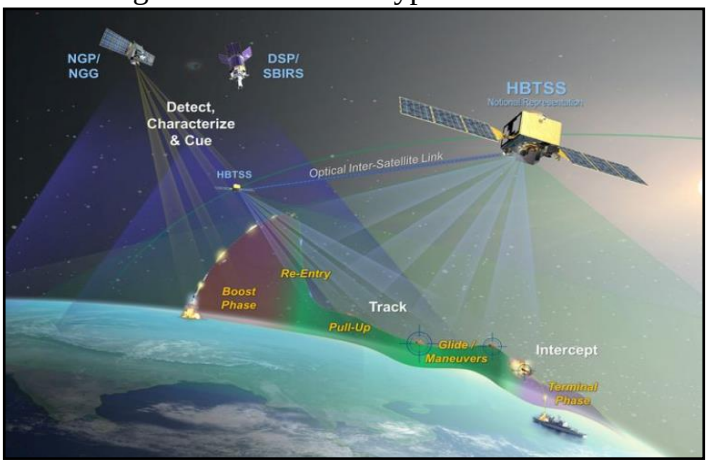
Northrop completes Hypersonic Missile Tracking Sensor Review

By Inder Singh Bisht

Northrop Grumman has completed a critical design review of its Hypersonic and Ballistic Tracking Space Sensor (HBTSS) prototype, a critical component of the US Space Force's Overhead Persistent Infrared (OPIR) missile warning satellite program.

The review "establishes the company's technical approach for precise, timely sensor coverage to defeat ballistic and hypersonic missiles," Northrop Grumman stated.

The HBTSS is intended to provide detection and "birth to death" tracking of a ballistic or hypersonic missile, including identification of the projectile's characteristics, "well before they come into view of the US land based defenses."



Hypersonic and Ballistic Tracking Space Sensor satellites will provide continuous tracking and handoff to enable targeting of enemy missiles launched from land, sea, or air. Image: Northrop Grumman

Overhead Persistent Infrared Program

The sensor will eventually be integrated with the OPIR multi-layered constellation of satellites that communicate to detect and track enemy missiles through their heat signatures.

The OPIR — successor to the current Space-Based Infrared Systems program — passed a critical design review in August, allowing developers to launch a planned geosynchronous equatorial orbit satellite in 2025.

Northrop Grumman OPIR and geospatial systems vice president Sarah Willoughby said that the critical design review "puts Northrop Grumman on track to deliver a vital component of our missile defense architecture to keep the US and its allies safe against hypersonic threats."

Prototype by 2023

The US defense giant is developing the sensor prototype under a $155 million contract it clinched in January and is scheduled to deliver it in 2023. Another defense firm, L3Harris, is developing another HBTSS prototype separately under a $122 million contract.

Once a prototype is delivered, it will go through an in-house "on-orbit test to demonstrate its ability to continuously track and rapidly process its observations of hypersonic threats, as well as its ability to effectively hand off the information so the missile is intercepted."

https://www.thedefensepost.com/2021/11/11/northrop-hypersonic-tracking-sensor/

FINANCIAL EXPRESS
Read to Lead

Fri, 12 Nov 2021

India-Russia get ready for the first ever 2+2 Ministerial Dialogue

Both Defence minister Rajnath Singh and external affairs minister S Jaishankar will visit Moscow for the maiden 2+2 Ministerial. Japan, Australia and the US are the other countries with whom India has 2+2 Ministerial Level talks.

By Huma Siddiqui

India and Russia are expected to hold their first ever 2+2 Ministerial Level Dialogue later this month. According to sources, "The dates have not been set for the dialogue expected to take place in Moscow. It will take place ahead of the annual summit which is scheduled for early next month."

Both Defence minister Rajnath Singh and external affairs minister S Jaishankar will visit Moscow for the maiden 2+2 Ministerial. Japan, Australia and the US are the other countries with whom India has 2+2 Ministerial Level talks.

What would be the focus of the first ever 2+2 Dialogue?

The first ever talks in this format are coming close on the heels of NSA level talks related to Afghanistan. On Wednesday (Nov 10, 2021) NSAs / Secretaries of the National Security Councils of Uzbekistan, Tajikistan, Kyrgyzstan, Kazakhstan and Turkmenistan along with Iran and Russia were present.

The Central Asian nations have expressed their concern over the refugees pouring in from Afghanistan and the possibility of radicalization, extremism and terrorism.

Both sides in Moscow will once again get an opportunity to review solutions to deal with the situation in Afghanistan and the impact it has on regional security. Terrorism, radicalization, drug trafficking, refugees, and inclusive government in Afghanistan will be topping the agenda of the talks. Other issues to be discussed between the two sides would also include the new military alliance of Australia, the UK and the US (AUKUS), the Asia-Pacific Region, Atomic Energy, the new recent developments in West Asia.

Also on the agenda is the extension of the Military-Technical Cooperation for 2021-2031. At the end of talks the two sides are likely to announce a joint commission on science and technology.

India & Russia Military Trade

The defence trade between India and Russia has witnessed a jump from USD 2-3 billion a year in 2018 to now around USD 9-10 billion. India is set to receive the first regimental set of S-400 air defence system later this year. Last month, an Indian Navy Frigate of P1135.6 class "Tushil'' was launched in Moscow. The contract for this frigate was inked in 2018 at the end of annual summit in New Delhi in the presence of Prime Minister Narendra Modi and the Russian President Vladimir Putin. The Inter-Governmental Agreement was for the construction of four frigates – two in Russia and two at the Goa Shipyard Limited under Transfer of Technology.

As has been reported in Financial Express Online, production for 700,000 AK-203 rifles is expected to start soon. The two sides are engaged in talks for procuring MiG-29K for the IAC-1, more T-90 tanks as well as additional Su-30 MKI for the Indian Air Force.

Both sides are expected to discuss costs and indigenous content in the production of Kamov 226T Helicopters in India. Through Transfer of Technology (ToT) these helicopters were expected to be manufactured under a joint venture Indo-Russian Helicopters Ltd (IRGL). A decision to manufacture them in India was taken in 2018.

https://www.financialexpress.com/defence/india-russia-get-ready-for-the-first-ever-22-ministerial-dialogue/2367222/

THE TIMES OF INDIA

Fri, 12 Nov 2021

Covid stalled Gaganyaan project, manned mission will finally be launched in 2023: ISRO Chief

By Surendra Singh

New Delhi: Indian Space Research Organisation (Isro) chairman K Sivan on Thursday disclosed that the final manned mission of Gaganyaan that got delayed due to the pandemic will finally be launched in 2023.

Talking at the Times Now Summit on the 'Space-The Final Frontier theme', the Isro chairman said, "We have planned for two unmanned missions before the crewed mission. We are planning to launch the first unmanned mission next year. And we will target to launch the second unmanned mission and the crewed mission in 2023."

He said despite Isro's best efforts, the earlier deadline to launch the mission before the 75 years of Independence could not be met due to the Covid-triggered restrictions. "However, we have now devised a new norm to work during the pandemic and soon we will launch more missions," he said.

On foreign investment, Sivan said, "In line with the Modi government's space reforms and to provide greater opportunities to private players, we are revising the FDI policy, which will open up huge avenues for foreign players to invest in India. The policy enables foreign players to tie up with Indian companies, which will not only greatly benefit both the players but also create a fertile environment for space industry and institutions to create new job opportunities, encourage innovation and contribute to the global space economy."

On increased participation of private players in the space sector, the Isro chief said the reforms will allow industries to have the opportunity to develop enabling technologies for space exploration.

"Isro will make announcements of opportunities for system requirements, which will be realised by the industry. Also, Isro will offer its facilities for testing as well as systems and subsystems developed by the industry to private players. This framework will also be useful for the development of artificial intelligence, machine learning, enabled robotics systems for space exploration, debris management and technologies for satellite missions," he said.

Space ecosystem for private players has two parts: First is commercialisation and second is participation in innovation and technology development, he said.

Sivan said Isro is formulating a comprehensive plan to bridge the space technology gap. "We want India to be No. 1 in all space activities in a few years from now."

https://timesofindia.indiatimes.com/india/covid-stalled-gaganyaan-project-manned-mission-will-finally-be-launched-in-2023-isro-chief/articleshow/87650517.cms

THE TIMES OF INDIA

Fri, 12 Nov 2021

ISRO enters X-band telemetry & command regime with new 18m antenna

By Chethan Kumar

The Indian Space Research Organisation (Isro) has commissioned a new 18m antenna, which for the first time, allows the space agency to conduct telemetry and command operations on the much faster X band (frequency). So far, Isro only used X band for payload data downloading and used the S band for telemetry and command.

Compared to S band, which operates with 2GHz to 4GHz, X band functions in 8GHz to 10GHz. Sources at Isro, terming this a major milestone, said this has two advantages: "First, it increases the speed of commands and second, reduces possibility of any interference given that the S band is now also used by telecom companies for 5G."

Isro chairman K Sivan said the antenna has been developed by ECIL (Electronics Corporation of India Limited) with some key systems coming from Bhabha Atomic Research Centre.

The antenna was developed from the funds meant for Aditya-L1 — India's first solar missions expected to be launched in late 2022 — and will be used for other deep space missions in the future too aside from being available for international customers.

"The indigenous antenna and station is capable of performing transmit and receive operations in both S and X bands. It is equipped with auto-tracking features in both the bands and is remotely operable from the Isro Telemetry, Tracking and Command Network (Istrac) network control centre and is CCSDS (Consultative Committee for Space Data Systems) compliant facilitating interoperability and cross-support among different space agencies," a senior scientist told TOI.

Another scientist said that with international agencies like Nasa having already migrated to X band for telemetry and command operations, Isro was unable to offer services so far. With the commissioning of the new antenna, the space agency will be able to attract more collaborations.

Confirming the developments, Isro chairman K Sivan, said: "Developed by ECIL (Electronics Corporation of India Limited) with some key systems coming from BARC (Bhabha Atomic Research Centre), the antenna has been commissioned in Byalalu here. It marks a new era as we can do telemetry operations in a new band, and it will also provide opportunities for NSIL to commercialise it in the future."

Sivan said that the demand for the said antenna arrived from Aditya-L1 and has been commissioned as part of the preparations for the mission. "But other deep space missions and satellites can also use it in the future," he said.

Aditya-L1 is India's first dedicated space-based solar observatory of India and will be around the Earth-Sun Lagrange point L1. "With the inclusion of multiple payloads, this project also provides an opportunity to solar scientists from multiple institutions within the country to participate in space-based instrumentation and observations. Thus the enhanced Aditya-L1 project will enable a comprehensive understanding of the dynamical processes of the sun and address some of the outstanding problems in solar physics," according to Isro.

https://timesofindia.indiatimes.com/india/isro-enters-x-band-telemetry-command-regime-with-new-18m-antenna/articleshow/87652642.cms

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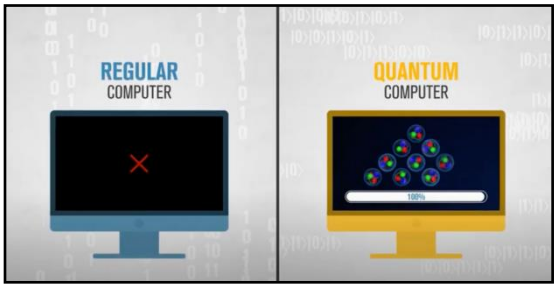
Fri, 12 Nov 2021

Researchers achieve first quantum simulation of baryons

A team of researchers led by an Institute for Quantum Computing (IQC) faculty member performed the first-ever simulation of baryons—fundamental quantum particles—on a quantum computer.



Credit: University of Waterloo

With their results, the team has taken a step towards more complex quantum simulations that will allow scientists to study neutron stars, learn more about the earliest moments of the universe, and realize the revolutionary potential of quantum computers.

"This is an important step forward—it is the first simulation of baryons on a quantum computer ever," Christine Muschik, an IQC faculty member, said. "Instead of smashing particles in an accelerator, a quantum computer may one day allow us to simulate these interactions that we use to study the origins of the universe and so much more."

Muschik, also a physics and astronomy professor at the University of Waterloo and associate faculty member at the Perimeter Institute, leads the Quantum Interactions Group, which studies the quantum simulation of lattice gauge theories. These theories are descriptions of the physics of reality, including the Standard Model of particle physics. The more inclusive a gauge theory is of fields, forces, particles, spatial dimensions and other parameters, the more complex it is—and the more difficult it is for a classical supercomputer to model.

Non-Abelian gauge theories are particularly interesting candidates for simulations because they are responsible for the stability of matter as we know it. Classical computers can simulate the non-Abelian matter described in these theories, but there are important situations—such as matter with high densities—that are inaccessible for regular computers. And while the ability to describe and simulate non-Abelian matter is fundamental for being able to describe our universe, none has ever been simulated on a quantum computer.

Working with Randy Lewis from York University, Muschik's team at IQC developed a resource-efficient quantum algorithm that allowed them to simulate a system within a simple non-Abelian gauge theory on IBM's cloud quantum computer paired with a classical computer.

With this landmark step, the researchers are blazing a trail towards the quantum simulation of gauge theories far beyond the capabilities and resources of even the most powerful supercomputers in the world.

"What's exciting about these results for us is that the theory can be made so much more complicated," Jinglei Zhang, a postdoctoral fellow at IQC and the University of Waterloo Department of Physics and Astronomy, said. "We can consider simulating matter at higher densities, which is beyond the capability of classical computers."

As scientists develop more powerful quantum computers and quantum algorithms, they will be able to simulate the physics of these more complex non-Abelian gauge theories and study fascinating phenomena beyond the reach of our best supercomputers.

This breakthrough demonstration is an important step towards a new era of understanding the universe based on quantum simulation.

The paper, "SU(2) hadrons on a quantum computer via a variational approach," was published in *Nature Communications* today.

More information: SU(2) hadrons on a quantum computer, arXiv:2102.08920 [quant-ph] arxiv.org/abs/2102.08920

Yasar Y. Atas et al, SU(2) hadrons on a quantum computer via a variational approach, *Nature Communications* (2021). DOI: 10.1038/s41467-021-26825-4

Journal information: *Nature Communications*

https://phys.org/news/2021-11-quantum-simulation-baryons.html

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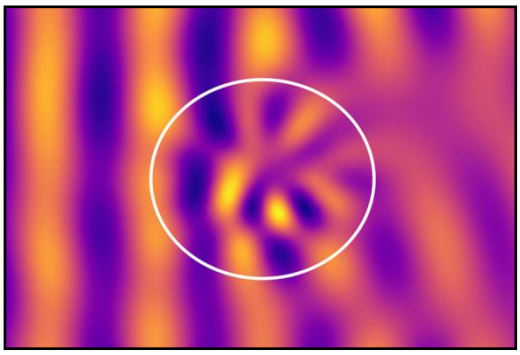
Fri, 12 Nov 2021

Radio-frequency wave scattering improves fusion simulations

By Paul Rivenberg

In the quest for fusion energy, understanding how radio-frequency (RF) waves travel (or "propagate") in the turbulent interior of a fusion furnace is crucial to maintaining an efficient, continuously operating power plant. Transmitted by an antenna in the doughnut-shaped vacuum chamber common to magnetic confinement fusion devices called tokamaks, RF waves heat the plasma fuel and drive its current around the toroidal interior. The efficiency of this process can be affected by how the wave's trajectory is altered (or "scattered") by conditions within the chamber.



This image shows the electric field scattering from a dense, turbulent plasma filament, which is represented by the white circle. While to the left (upstream) of the filament the wave trajectory is undisturbed, to the right it is distorted, destroyed due to scattering. Understanding this scattering will be key to designing future RF antennas. Credit: Bodhi Biswas

Researchers have tried to study these RF processes using computer simulations to match the experimental conditions. A good match would validate the computer model, and raise confidence in using it to explore new physics and design future RF antennas that perform efficiently. While the simulations can accurately calculate how much total current is driven by RF waves, they do a poor job at predicting where exactly in the plasma this current is produced.

Now, in a paper published in the *Journal of Plasma Physics*, MIT researchers suggest that the models for RF wave propagation used for these simulations have not properly taken into account the way these waves are scattered as they encounter dense, turbulent filaments present in the edge of the plasma known as the "scrape-off layer" (SOL).

Bodhi Biswas, a graduate student at the Plasma Science and Fusion Center (PSFC) under the direction of Senior Research Scientist Paul Bonoli, School of Engineering Distinguished Professor of Engineering Anne White, and Principal Research Scientist Abhay Ram, who is the paper's lead author. Ram compares the scattering that occurs in this situation to a wave of water hitting a lily pad: "The wave crashing with the lily pad will excite a secondary, scattered wave that makes circular ripples traveling outward from the plant. The incoming wave has transferred energy to the scattered wave. Some of this energy is reflected backwards (in relation to the incoming wave), some travels forwards, and some is deflected to the side. The specifics all depend on the particular attributes of the wave, the water, and the lily pad. In our case, the lily pad is the plasma filament."

Until now, researchers have not properly taken these filaments and the scattering they provoke into consideration when modeling the turbulence inside a tokamak, leading to an underestimation of wave scattering. Using data from PSFC tokamak Alcator C-Mod, Biswas shows that using the new method of modeling RF-wave scattering from SOL turbulence provides results considerably different from older models, and a much better match to experiments. Notably, the "lower-hybrid"

wave spectrum, crucial to driving plasma current in a steady-state tokamak, appears to scatter asymmetrically, an important effect not accounted for in previous models.

Biswas's advisor Paul Bonoli is well acquainted with traditional "ray-tracing" models, which evaluate a wave trajectory by dividing it into a series of rays. He has used this model, with its limitations, for decades in his own research to understand plasma behavior. Bonoli says he is pleased that "the research results in Bodhi's doctoral thesis have refocused attention on the profound effect that edge turbulence can have on the propagation and absorption of radio-frequency power."

Although ray-tracing treatments of scattering do not fully capture all the wave physics, a "full-wave" model that does would be prohibitively expensive. To solve the problem economically, Biswas splits his analysis into two parts: (1) using ray tracing to model the trajectory of the wave in the tokamak assuming no turbulence, while (2) modifying this ray-trajectory with the new scattering model that accounts for the turbulent plasma filaments.

"This scattering model is a full-wave model, but computed over a small region and in a simplified geometry so that it is very quick to do," says Biswas. "The result is a ray-tracing model that, for the first time, accounts for full-wave scattering physics."

Biswas notes that this model bridges the gap between simple scattering models that fail to match experiment and full-wave models that are prohibitively expensive, providing reasonable accuracy at low cost.

"Our results suggest scattering is an important effect, and that it must be taken into account when designing future RF antennas. The low cost of our scattering model makes this very doable."

"This is exciting progress," says Syun'ichi Shiraiwa, staff research physicist at the Princeton Plasma Physics Laboratory. "I believe that Bodhi's work provides a clear path to the end of a long tunnel we have been in. His work not only demonstrates that the wave scattering, once accurately accounted for, can explain the experimental results, but also answers a puzzling question: why previous scattering models were incomplete, and their results unsatisfying."

Work is now underway to apply this model to more plasmas from Alcator C-Mod and other tokamaks. Biswas believes that this new model will be particularly applicable to high-density tokamak plasmas, for which the standard ray-tracing model has been noticeably inaccurate. He is also excited that the model could be validated by DIII-D National Fusion Facility, a fusion experiment on which the PSFC collaborates.

"The DIII-D tokamak will soon be capable of launching lower hybrid waves and measuring its electric field in the scrape-off layer. These measurements could provide direct evidence of the asymmetric scattering effect predicted by our model."

More information: Bodhi Biswas et al, A hybrid full-wave Markov chain approach to calculating radio-frequency wave scattering from scrape-off layer filaments, *Journal of Plasma Physics* (2021). DOI: 10.1017/S0022377821001033

https://phys.org/news/2021-11-radio-frequency-fusion-simulations.html

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Fri, 12 Nov 2021

Researchers observe Marcus inverted region of charge transfer from low-dimensional semiconductor materials

By Zhang Nannan

Charge transfer is a key step in photosynthesis, biological signal transduction, and conversion of various energy sources. The theoretical framework for charge transfer was established by Rudolph Marcus in the 1950s. It predicts the existence of a so-called "Marcus inverted region," where the transfer rate decreases with increasing reaction exothermicity (or driving force).

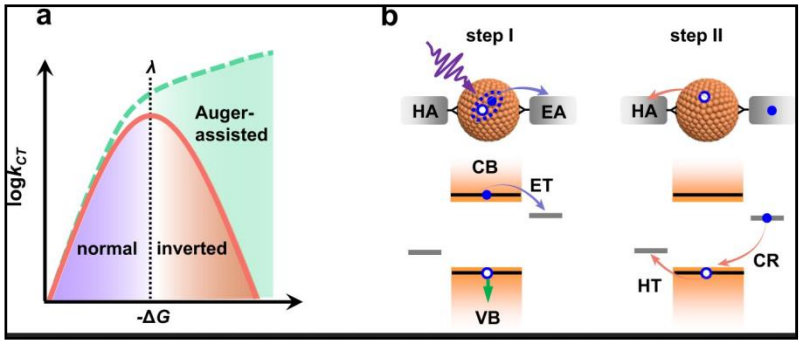

Fig. 1: Charge transfer (CT) models. a Marcus theory (red solid line) predicts a normal region (blue shading) and an inverted region (red shading) when the driving force (−ΔG) is smaller and larger, respectively, than the reorganization energy (λ), whereas the Auger-assisted CT model (green dashed line) exhibits a monotonic increase of CT rate (kCT) because the excessive driving force can be used to excite another Coulomb-couple charge. b For a photoexcited QD attached with electron (EA) and hole acceptors (HA), the first CT event (e.g., ET electron transfer) was proposed to occur via the Auger-assisted model (step I). In contrast, in step II, the second CT (e.g., HT hole transfer) obeys Marcus theory as it is not coupled any other charges, so does the energy-wasting charge recombination (CR) process. HT and CR are parallel, competing processes in step II. Credit: DOI: 10.1038/s41467-021-26705-x

Low-dimensional semiconductor materials are attracting enormous attention because of their strong potential for optoelectronic and energy-related applications. To date, however, it remains unclear whether Marcus theory is applicable to the charge transfer behavior of these materials.

Recently, a research group led by Prof. Wu Kaifeng from the Dalian Institute of Chemical Physics (DICP) of the Chinese Academy of Science (CAS) observed the Marcus inverted region of charge transfer from low-dimensional semiconductor materials.

This study was published in *Nature Communications* on Nov. 3.

The researchers built a unique model system using zero-dimensional quantum dots or two-dimensional nanoplatelets and surface-adsorbed molecules that allows for measuring charge transfer from transiently-populated, single-charge states.

Combined with the capability of tuning the electron transfer driving forces through the quantum confinement effect, this measurement allowed to probe the fundamental energetics dependence of electron transfer, and to reveal a Marcus inverted region for these low-dimensional semiconductor materials.

"This is the first observation of a Marcus inverted region for low-dimensional semiconductor materials," said Prof. Wu. "It may benefit energy conversion applications of these materials."

More information: Junhui Wang et al, Marcus inverted region of charge transfer from low-dimensional semiconductor materials, *Nature Communications* (2021). DOI: 10.1038/s41467-021-26705-x

Journal information: *Nature Communications*

https://phys.org/news/2021-11-marcus-inverted-region-low-dimensional-semiconductor.html

mint

Fri, 12 Nov 2021

Type 2 diabetes patients show high fatigue post covid-19

The study showed that diabetes complicates course of covid-19 and results in excess morbidity and mortality

By Neetu Chandra Sharma

New Delhi: Type 2 diabetes patients inflicted with SARS-CoV-2 witness significantly more fatigue when compared with patients without a history of covid-19, showed a new study.

Presence of diabetes also influences post covid syndrome or long covid-19 via various pathophysiological mechanisms. (MINT_PRINT)

The study, conducted jointly by All India Institute of Medical Sciences (AIIMS) and Fortis C-DOC with others and published in the journal, Diabetes & Metabolic Syndrome: Clinical Research & Reviews, said the results show that diabetes complicates course of covid-19 and results in excess morbidity and mortality. Presence of diabetes also influences post covid syndrome or long covid-19 via various pathophysiological mechanisms. The study done on over 108 type 2 diabetes patients further said diabetes poses challenges in the recovery of patients.

Patients studied included 52 Type 2 diabetes patients who had suffered from covid-19 with mild to moderate severity; 56 Type 2 diabetes patients who did not suffer from covid-19. Both groups were matched for age, duration of diabetes, BMI, TSH, serum albumin and vitamin D levels.

The study found that T2D patients who had covid-19 showed significantly more fatigue when compared with patients who did not have Covid-19 but both groups had comparable handgrip strength.

“T2D with previous COVID-19 infection and who had Fatigue score > 4 have (high fatigue level) had significant higher inflammation markers during acute illness, and post covid-19, had increased post prandial blood glucose levels, lost more weight, had reduced physical activity and showed significantly lower handgrip strength as compared to those with Fatigue score < 4. Overall, high fatigue seems to result from severe COVID-19, and high blood sugar levels," the study said.

The results further showed that rehabilitation of those with fatigue score>4 after acute infection would require careful attention to nutrition, glycemic control and graduated physical activity protocol.

“These findings are particularly relevant in view of increased prevalence of severe diabetes during times of covid-19. Fatigue is a predominant and very debilitating factor, present afterwards in both hospitalized and non-hospitalized COVID patients. Fatigue and associated symptoms decrease quality of life and interfere with normal working capacity. It is imperative, therefore, for chronic diabetic patients to follow a healthy lifestyle, adhere to treatment guidelines and go for regular health checks," said Dr Anoop Misra, executive chairman and director, Diabetes and Endocrinology, Fortis C-DOC.

Misra suggested that covid-19 fatigue should be addressed through a multidisciplinary approach which includes the treating clinician, psychological counsellor, nutritionist, and physical therapy

expert. Blood glucose and blood pressure should be optimal and more aggressive glycemic management is required.

"Special care must be taken regarding nutrition and protein and vitamin supplements should be used as required. Exercise and physiotherapy should be started early after covid-19 as it may benefit not only fatigue but cardiovascular and pulmonary health and mental well-being of the patient," said Misra.

https://www.livemint.com/news/india/type-2-diabetes-patients-show-high-fatigue-post-covid19-11636628770950.html