Ask Me Anything Webinars - Session 3

TX02- Flight Computing and Avionics, TX11 – Software, Modeling, Simulation, and Information Processing, TX15 – Flight Vehicle Systems and TX16 – Air Traffic Management and Range Tracking Systems

TX and Subtopic	Question	Answer
TX02 – Flight Computing and Avionics - Z-ENABLE.02 - Scope Title: Coprocessors for Digital Signal Processing (DSP) and Artificial Intelligence (AI)	1. Will a spot radiation shielding technology that is applied on COTS electronic component be of interest? i.e. a paste that is directly 3D printed on electronics of interest? 2. Can you give an example of COTs component that we can plan to coat in Phase 1?	1) In general, yes, this is something that would be in scope for this topic. 2) I don't want to name any parts specifically. But in general, we're very interested in coprocessors. In particular, anything that can accelerate computation. GPUs that work well with the risk 5 instruction set architecture.
TX11 - Software, Modeling, Simulation, and Information Processing - A1.06 Vertical Takeoff and Landing (VTOL) Vehicle Technologies Vehicle Design Tool & Electric Powertrain Test Capability	Letters of commitment from launch customers are one of the Phase I deliverables, but it is also mentioned that a strong proposal will have one or more identified launch customers with letters. Can you confirm that having a launch customer is not a requirement at the proposal stage? Is it possible to perform a clean sheet aircraft design during Phase I? If not, what should be the minimum TRL at the proposal stage?	The request for letters of commitment applies to A1.04 and A1.09 topics; not applicable to A1.06. 2: This also appears to apply to different topics and is not relevant to A1.06.
TX11 - Software, Modeling, Simulation, and Information Processing - S17.01	Development and demonstration of Simulation software for large-scale coupled CFD & DEM problems that is an order of magnitude faster execution than most conventional models (because of being based on use of GPU's) an appropriate topic for topic TX11?	Yes. That's for the exascale computing part of S 1701. So that is definitely in scope.
TX11 - Software, Modeling, Simulation, and Information	Back to S14.01 Space Wx R2O2R subtopic in TX11, would NASA be interested in development of system-impact products	Yes. From a space weather standpoint, there is definite interest if you want to go extraterrestrial space. Cis-lunar space in particular is of interest. But anywhere that

Processing - S14.01	(satellite anomalies, satcom effects, radar effects, GMIC effects on power systems, etc) for extra-terrestrial (lunar, other planets, etc) mission applications?	links toward a present or future NASA mission is potentially in scope.
TX11 - Software, Modeling, Simulation, and Information Processing	Is development of a significantly more efficient coupled CFD-DEM simulation model an appropriate topic for TX11? (possible order of magnitude improvement because of GPU utilization).	This is definitely within scope.
TX11 - Software, Modeling, Simulation, and Information Processing – Z-ENABLE.02	Would ARM be a consideration as well?	Arm processors are being used in the current HPC systems. Not as heavily as the AMD systems and the Intel systems, but yes, arm is a consideration as well. We're very interested in getting these libraries up to the task, specifically around risk 5 and risk 5 vector extensions. Less interested in arm.
TX11 - Software, Modeling, Simulation, and Information Processing – Z-ENABLE.02	For TX11 subtopic ZENABLE.02, would ARM be a consideration as well?	This sub topic is specifically for NC2 computing, computing in space. NASA has a system on a chip in development with multicore risk 5 system on a chip. What we see is that for X86 and arm, a lot of the libraries, that target those platforms but risk 5 being a newer is not up to the same capability. We see an unmet need there and we're very interested in getting these libraries up to the task, specifically around risk 5 and risk 5 vector extensions.
TX15 - Flight Vehicle Systems - T15.04: Full-Scale (Passenger/Cargo) Electric Vertical Takeoff and Landing (eVTOL) Scaling, Propulsion, Aerodynamics, and Acoustics Investigations	At what point would flight testing be expected? OR Can you expand on expectations for flight testing?	The sooner the better. Flight testing is difficult and is often pushed back for various reasons. Flight clearances, weather those kind of things. The sooner is better, also the product of flight test is data and a lot of times that's overlooked. The sooner you do the flight test, the more you can look at the data and verify the data. Expectations for flight testing really depends on what you're proposing. There's a lot of variation in the proposals that we've gotten so far.
TX15 - Flight Vehicle Systems - A1.02 Quiet	1) Is there interest in ducted propeller noise computation and noise source identification?	The current Quiet Performance solicitation is focused on solutions to mitigate the impact of airframe noise on communities. A

Performance Airframe Noise	2) In Phase 1, will a computational demonstration be sufficient to demonstrate using an active control system for broadband noise attenuation, and a prototype in Phase 2 with test data?	proposal focused solely on characterizing propulsion noise, such as noise source identification from a ducted propeller, would not be in scope. For active control, a computational demonstration may be sufficient but it really depends on the technology in the proposal. The proposal should demonstrate an appreciation of the risks going from computation to physical prototype. These might include actuator bandwidth, sensor placement, and control algorithm complexity. If a computational study addresses the impact of those risks on the proposed active noise control technology, then a computational demonstration is sufficient for phase one.
TX15 - Flight Vehicle Systems - T15.04 Full-Scale (Passenger/Cargo) Electric Vertical Takeoff and Landing (eVTOL) Scaling, Propulsion, Aerodynamics, and Acoustics Investigations	1) Is there interest in ducted propeller noise computation and noise source identification? 2) In Phase 1, will a computational demonstration be sufficient to demonstrate using an active control system for broadband noise attenuation, and a prototype in Phase 2 with test data?	1) They are solving the noise problems in different ways at this point. The technology's moving very quickly and changing pretty much daily, but at this time, most are moving away from the ducted rotors and propellers due to the added weight and complexity. But that's up to what you're proposing and what innovations you have. 2) In general, yes. You typically need to expand that into the flight tests clearly into the phase two. So that you're making that work relevant. What I've seen is that pieces get missed and or isn't clear enough, if you're going to go that direction, just be clear.
TX15 - Flight Vehicle Systems – T15.04	Scope 2 adds "simulation" to the scope. However, the text also says "Proposals are sought to design and execute experiments...". Is it intended that simulations be used to design and execute experiments?	Typically if you do any work ahead of time, it makes the proposal stronger. If you need to do that in phase one, that would make phase two stronger. Anything you can build on to reduce the risk of what you're going to be doing in both phase one and phase two always comes across much better in a proposal.
TX15 - Flight Vehicle Systems – T15.04	Can existing experimental data be used under the project, or is there a need for the design and execution of new experiments?	Anything prior is great, but you also could find those findings withing the Phase I program.
TX15 - Flight Vehicle Systems – T15.04	What do "Flying qualities" incorporate?	We're trying to look at handling qualities and ride quality. Flying qualities is kind of a broad term. We would like to see some flight tests and simulation to match up in part of that also. We need to build up the the steps to

		get to more difficult problems, and that's the direction we're trying to go with that.
TX15 - Flight Vehicle Systems – T15.04	Does "design and execution of experiments" need to occur during a Phase II period of performance or is the expectation that the performance of the experiments occurs after the Phase II period of performance?	Typically, it should be phase one or phase two. We're not always involved, so that typically doesn't meet the intent of the subtopic.
TX15 - Flight Vehicle Systems – A1.02	I see that there is interest in broadband acoustic liners to reduce airframe noise or noise due to propulsion-airframe interactions but liners inside the engine nacelle are excluded. So my question is are there any specific locations for which the liners are of interest for NASA?	Potential liner locations include parts of the airframe that reflect or interact with significant noise sources like the engine, where an absorbing liner could reduce the total sound radiated to the community. Other potential liner locations include areas where an impedance boundary condition could disrupt the noise generation mechanism. This might include the side edge of a flap, or a landing gear door.
TX15 - Flight Vehicle Systems – T15.04	What level of detail is expected in the Phase I aerodynamic modeling and propulsion system analysis? For instance, is there a preference for computational methods like LES or VPM over others?	In general, no. There's not a preference, but for CFD, it's computationally expensive and takes a lot of time and effort. If you can lean away from those, it's probably better. But it depends on what you're proposing and what you're trying to do.
TX15 - Flight Vehicle Systems	Regarding acoustics modeling for eVTOLs—there was at least 1 Phase I and Phase II awardee in this area. Is there still interest in submissions on this topic? We have an approach on modeling rotor/airframe noise interactions.	Yes, I believe it is of interest. But there are current awardees. You need to expand into a new sector or show an improvement above what's currently being done. It's going to be a little bit more of a challenge to go that direction.
TX16 - Air Traffic Management and Range Tracking Systems – A3.03	The A3.01 Advanced Air Traffic Management for Traditional Aviation Missions subtopic, which was present in past Phase I SBIR solicitations, is not present in the 2025 solicitation. Does this mean that NASA will not accept any R&D ideas pertaining to air traffic management technologies for traditional aviation missions? Is there an alternative subtopic (other than	Correct. NASA is not accepting R&D ideas pertaining to air traffic management for traditional aviation missions in this 2025 SBIR cycle. I don't have insight into the reason it was dropped this year.

	the Aviation Safety-specific A3.03) where proposers can submit ideas relevant to air traffic management of traditional operations?	
TX16 - Air Traffic Management and Range Tracking Systems – A3.02	Is A3.02 Wildfire Response scope focused on coordination to monitor wildfire prone areas for early detection of wildfires, or to coordinate active wildfire fighting efforts, or both?	The short answer here is both.
TX16 - Air Traffic Management and Range Tracking Systems – A3.03	Are proposals to enhance traditional aviation safety within scope of A3.03? Or must proposals address new entrants (UAS, AAM, etc.)? Please respond generally to A3.03 and specifically to the IASMS scope, especially bullet points under R&D of In-time System-wide Safety Assurance objectives and Supporting safety prognostic decision-support tools, automation, techniques, strategies, and protocols.	Yes, absolutely. There is room in A3.03. The concern or challenge with submitting a proposal to A3.03 that is purely for traditional safety, so a tubing airport without any UA after AAM operation may not be considered as strong of a proposal as other proposals submitted to the same sub topic that do have UAS and AAM tailored proposed work. I advise if you want to find an avenue to submit your proposal and a 303 is the closest fit for the proposal with the traditional aviation safety, is to tailor your proposal where the work will work more immediately. Support traditional, but it has the opportunity and potentially for follow on work to help with UASA AM research and development later. The bullet points that are underneath the ISMS objectives, those are areas that you can explore for traditional aviation safety.
TX16 - Air Traffic Management and Range Tracking Systems – A3.02	Is a solution focused on surface operations within the scope of this topic?	Yes
TX16 - Air Traffic Management and Range Tracking Systems – A3.02	Is a solution focused only on "low altitude airspace and around major airports" responsive to this topic?	Yes
TX16 - Air Traffic Management and Range Tracking Systems – A3.02	Is it expected that the the solution will be tested with human subjects for functional validation during Phase I and/or Phase II?	The objective of Phase I is to demonstrate the basic feasibility of an idea... proof of concept. Including testing with humans in the loop would certainly strengthen a Phase I effort, but it isn't a requirement, and it isn't typical to see that in a Phase I proposal. Human-in-the-loop testing may become more important in Phase II. It depends of

		course on what your idea is and how human-focused it is.
TX16 - Air Traffic Management and Range Tracking Systems – A3.03	Is there any interest in the use of urban digital twins to manage/optimize air traffic in cities?	Yes, that's within scope.
TX16 - Air Traffic Management and Range Tracking Systems – A3.03	Could you clarify whether the IASMS requirements include specific protocols or frameworks for integrating external real-time RF (GNSS/LTE) interference detection and geolocation data into NASA's safety management tools?	For this proposal for a small business to develop this technology, we don't have any protocol or any framework requirements for integrating that. We definitely want that researched and so if a proposal was submitted with that it would be beneficial and something worse investigating.
TX16 - Air Traffic Management and Range Tracking Systems – A3.02	Nontraditional Aviation Operations for Advanced Air Mobility (AAM) Is there an interest in human-autonomy-teaming for information gathering tasks. For example, an operator may be interested in an indicator of interest and an agent would devise an efficient information gathering plan.	I would say human autonomy teaming is within scope for subtopic 3.0. It does need to be related to the focus. But the human autonomy teaming is definitely within scope.
TX16 - Air Traffic Management and Range Tracking Systems – A3.02	Are there any specific or preferred metrics for airspace safety in high-density operations?	No, there are no specific or preferred metrics for safety. Consult the literature on safety in high-densite operations and feel welcome to propose metrics you think are most useful/relevant.
TX16 - Air Traffic Management and Range Tracking Systems – A3.03	Are proposals that provide a solution for Data Fusion, but do not cover Decision Fusion for IASMS of interest? For example, the system would provide sensor data, tracks, and alerts around near airport/vertiport and ground operations. These alerts would need to be fused with other system-wide data to realize enhanced decision making.	That is a precursor piece of research for A3.03. If a proposal was submitted with just that, it would need the next step, which is the data fusion as they described, which would be the decision being made either by the machine or the person operating the machine based on that data, and so that would be a piece of the proposal. It falls under A3.03 but it wouldn't meet the final product that we would want to fund through a phase one.
TX16 - Air Traffic Management and Range Tracking Systems – A3.02	Would autonomous operation of our long-endurance solar-powered platform (focused on wildfire assessment, analysis, etc.) fit into this category?	It depends on what the contribution would be here. This subtopic focuses on the coordination of a firefighting effort and the the sensing of information and dissemination of that information. There are other subtopics oriented toward autonomous

		systems (A2.02, I think). So, if the proposed innovation is the autonomous control of a vehicle, that would be out of scope for this subtopic. However, if the innovation is making new information available to the fire-management operation that wasn't or wouldn't be available otherwise, that's a better fit with this subtopic.
TX16 - Air Traffic Management and Range Tracking Systems – A3.03	How could enhancing the NASA-TLX with real-time AI-augmented EEG systems contribute to the development of future aviation safety by providing continuous insights into cognitive problem-solving loads during training and operational scenarios?	It's tricky topic because of the AI element in particular. It depends on what you define AI as and if you're using an LLM versus machine learning with an algorithm that you've developed where the proposal is developing an algorithm that's going to change the response. Developing training does not fall under A3.03.
TX16 - Air Traffic Management and Range Tracking Systems – A3.03	Is GPS/Cellular coverage data and RF Interference (jamming/spoofing) detection relevant for integrating into the management safety tools?	Machine learning to improve air traffic controller training was not the intent. Using AI or LM or machine learning for purely air traffic controller training would not be in scope. If you tailor your proposal where you have air traffic controller training that somehow ties to A3.O3. Yes, but purely by itself, no. Regardless of the use of AI or not.
TX16 - Air Traffic Management and Range Tracking Systems – A3.03	Is the monitoring and modeling of UAS component level performance and failure rate data within scope on this subcategory?	Yes, it is in scope as long as it's like part of it. So not just the data, but modelling using that data. Yes, absolutely. Like that would absolutely fall under the collision avoidance portion.
TX11 - Software, Modeling, Simulation, and Information Processing	We are considering a SBIR proposal related to developing a novel error-correction scheme to provide higher reliability in the presence of radiation for higher-density flash memories to enable higher capacity and performance. In the 2024 phase 1 solicitation, there was a scope titled "Solid-state Memory-devices" listed under the same subtopic, but is not listed in the current release. Would this proposal topic still be relevant and within scope of the subtopic as a key IP core for flash storage?	We did have SSDs listed as a scope in our previous solicitation. We do not have it listed as a scope in this year's solicitation. The primary reason for that is we're seeing larger commercial companies are starting to offer solutions in the space.

TX11 - Software, Modeling, Simulation, and Information Processing	Co-processor: Is there any priority to the list in the solicitation?	In short, no, there's no priority. Everything is of equal weight in the solicitation.
TX11 - Software, Modeling, Simulation, and Information Processing - TX11.3/S17.02	Seems like the ability to move system models (flight dynamics, propulsion, mass properties, GNC) between simulation tools across Agency and vendors would be important. Is this an appropriate technology to address in an SBIR proposal? or do such interchange standards exist? Would a proprietary interface be appropriate, or would it need to be an open standard?	The answer is yes. That capability is important. However, interoperability is key. We try to avoid vendor lock. Proprietary formats are usually not desired if at all possible. The key thing is to be able to integrate those different types of simulation and modeling environments across geographically distributed, across NASA and across with our vendors.
TX16 - Air Traffic Management and Range Tracking Systems	Any interest in Noise Reduction In Engines?	The Quiet Performance subtopic traditionally alternates between a propulsion noise focus and an airframe noise focus; this year the focus is on airframe noise. A solution that targets engine noise is more suitable for the propulsion noise-focused solicitation and would not be in scope for the current solicitation. Solutions that seek to reduce airframe noise, including aerodynamic and acoustic interactions with an engine, are in scope.
TX11 - Software, Modeling, Simulation, and Information Processing - S14.01	Any interest in sensors / techniques to collect / measure Space Weather related data?	Yes, indeed. We have a serious need for space weather data throughout the heliosphere. One of the three scopes in the S14.01 subtopic is Space Weather Instrumentation, which aligns with the TX08 taxonomy.
TX11 - Software, Modeling, Simulation, and Information Processing - Z2.02	Is immutable, data storage hardware that stores data for 100+ years, is inherently resistant to ionizing radiation and EMP and uses negligible energy and uses commonly available components in scope for this subtopic?	Yes, in general this is something that we're interested in and in scope for the subtopic. It's not explicitly listed in the solicitation. From a programmatic perspective, I'm not sure how something like that would be handled.
TX11 - Software, Modeling, Simulation, and Information	Does the "experiment" have to be scientific in nature, or could it be something more traditionally in the Tech Dev realm (SDA/Orbit	Yes, to both questions. Although when it comes to tools, the key things we're looking at to make sure that whatever tools they are,

Processing - S17.02	Debris, Autonomy Sensors, Tip/Cue, etc), and are tools that are not SysML/UML based ok? (Thinking something more like what scientists use, like python/R/C/etc.)	they meet industry interoperability standards.
TX11 - Software, Modeling, Simulation, and Information Processing – S14.01	Are the technologies should the technologies be mapped to current/future Mission Needs (Artemis/lunar to Mars)?	From a space weather standpoint it makes a stronger proposal, but it's not necessarily required. It's stronger to make it tied to NASA mission needs, but really you want to go back to, for example, the Gap Analysis document from APL. Tying it to any place where we've identified gaps or mission requirements is useful. SWx Science and Observation Gap Analysis Report: https://smd-cms.nasa.gov/wp-content/uploads/2023/11/gapanalysisreport-full-final.pdf
TX11 - Software, Modeling, Simulation, and Information Processing	Could you clarify which libraries specifically are missing for RISC-V ?	I would highly encourage you to read through the scope for this subtopic in detail. It gives several examples. It doesn't just target libraries. But it's a risk five ecosystem in general and the scope gives several examples of this.