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Possible Sessions:

- ICES 506: Human Exploration Beyond Low Earth Orbit: Missions and Technologies could be an option
- ICES 403: Extravehicular Activity: Spacesuit and Surface Mobility Operations

Working Title: Supporting Exploration Missions by Enabling Exploration Mission System Software

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Abstract (Not to exceed 300 words):

Future exploration missions will consist of a multitude of data sources, systems, and operators collaborating to complete mission objectives. Presently, NASA is instantiating the contractual mechanisms, such as the xEVAS and HLS contracts, to produce these mission assets. Architectural planning is also underway to establish the networking protocols and infrastructure to digitally create and connect mission elements, such as LunaNET. However, without new horizontally integrated data systems, these advancements will be limited in their ability to get mission data appropriately integrated into the plan, train, fly, explore workflow of the operations workforce. Here we describe several mission system software development efforts underway that are designed to support human spaceflight missions. We describe the current iterations of a suite of tools to support EVA procedure authoring and execution, for both ISS and Artemis missions, as well as a software solution to establish and interact with mission context and data products. These tools have been developed iteratively and continue to be tested in several NASA facilities such as the Neutral Buoyancy Lab (NBL), Artemis field testing, and in present-day International Space Station (ISS) operations on orbit. Our solutions demonstrate how software development can be aligned with ongoing operations development activities to discover the features that best support future human spaceflight missions.