## EXTENSIBLE ADAPTABLE SIMULATION SYSTEMS: SUPPORTING MULTIPLE FIDELITY SIMULATIONS IN A COMMON ENVIRONMENT

Brian McLaughlin NASA Goddard Space Flight Center Mailstop 474 – JPSS Ground Project Greenbelt, MD 20771 (240) 684-0864 brian.j.mclaughlin@nasa.gov

> Larry Barrett Orbital Sciences Corporation larry.k.barrett@nasa.gov

## ABSTRACT

Common practice in the development of simulation systems is meeting all user requirements within a single instantiation. The Joint Polar Satellite System (JPSS) presents a unique challenge to establish a simulation environment that meets the needs of a diverse user community while also spanning a multi-mission environment over decades of operation. In response, the JPSS Flight Vehicle Test Suite (FVTS) is architected with an extensible infrastructure that supports the operation of multiple observatory simulations for a single mission and multiple mission within a common system perimeter. For the JPSS-1 satellite, multiple fidelity flight observatory simulations are necessary to support the distinct user communities consisting of the Common Ground System development team, the Common Ground System Integration & Test team, and the Mission Rehearsal Team/Mission Operations Team. These key requirements present several challenges to FVTS development. First, the FVTS must ensure all critical user requirements are satisfied by at least one fidelity instance of the observatory simulation. Second, the FVTS must allow for tailoring of the system instances to function in diverse operational environments from the High-security operations environment at NOAA Satellite Operations Facility (NSOF) to the ground system factory floor. Finally, the FVTS must provide the ability to execute sustaining engineering activities on a subset of the system without impacting system availability to parallel users. The FVTS approach of allowing for multiple fidelity copies of observatory simulations represents a unique concept in simulator capability development and corresponds to the JPSS Ground System goals of establishing a capability that is flexible, extensible, and adaptable.