SPACE SYSTEMS SYMPOSIUM (D1)
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USING SATELLITE TOOL KIT FOR EVALUATING POTENTIAL OPERATIONAL SCENARIOS OF THE EUROPA JUPITER SYSTEM MISSION

Abstract

The Europa Jupiter System Mission (EJSM) is planned to launch in 2020. EJSM would be a joint mission between NASA and ESA, the NASA-led portion sending an orbiter to Europa and the ESA-led portion sending an orbiter to Ganymede. Both orbiters would spend a significant amount of time in the Jovian system prior to their orbital missions, allowing for synergistic science to take place. In the coming years, the instrument payload suites for both flight systems, the design of both spacecraft, and the mission trajectories will all be developed in detail. A primary concern during this development time is the ability to adapt and analyze the effects that changes in these areas will have on the feasibility and achievability of the science goals. Mission scenario analyses are currently in development and will need to be easily modified and analyzed in a rapid and repeatable environment in order to evaluate the achievability of science objectives against a given payload, spacecraft, or trajectory. The Satellite Tool Kit (STK), developed by Analytical Graphics Incorporated (AGI), provides a commercial-off-the-shelf environment in which to conduct these analyses. STK has a well-documented, user-friendly, customizable interface with standard visual, graphical, and textual outputs, which minimize development, analysis, and product generation time. STK is currently being used on EJSM for Jovian tour scenario development (including opportunities for synergistic science), Galilean moon flyby coverage analysis, Europa orbit scenario analysis, and public outreach product generation. The EJSM capability in STK is currently being expanded and customized to do spacecraft resource modeling and Jovian environment analyses and visualization, including radiation and magnetic field modeling.