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Iris Deep Space Transponder Testing at Space Dynamics Laboratory, Jet Propulsion Laboratory, and DSN Test Facility (DTF)-21

Thirteen deep-space CubeSats have been selected as secondary payloads on the Space Launch System (SLS) Exploration Mission (EM)-1 launch of the Orion spacecraft. Six of these CubeSats - Lunar Polar Hydrogen Mapper (LunaH-Map), Lunar IceCube, Lunar Flashlight, CubeSat for Solar Particles (CuSP), Near-Earth Asteroid Scout (NEA Scout), and BioSentinel - have baselined the Iris deep space transponder as the main telecommunications and navigation radio for their missions. These CubeSats have unique science goals, ranging from mapping the presence of water on the moon, to exploring the effects of deep-space radiation on the biology of yeast. As such, missions have exploited the flexible architecture of the Iris radio in order to meet their specific telecom requirements (e.g. higher data rates for lunar missions versus heliocentric missions, use of turn-around ranging as opposed to the delta-differential one-way ranging (DDOR), etcetera). This paper shows the different Iris testing, conducted at the various test facilities i.e. vendor-specific testing at the Space Dynamic Laboratory (SDL), mission-specific testing at the Jet Propulsion Laboratory (JPL), and RF compatibility testing at the DSN Test Facility (DTF)-21