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Thermo-physical performance prediction of the KSC Ground Operation Demonstration Unit for liquid hydrogen

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The NASA Kennedy Space Center researchers have been working on enhanced and modernized cryogenic liquid propellant handling techniques to reduce life cycle costs of propellant management system for the unique KSC application. The KSC Ground Operation Demonstration Unit (GODU) for liquid hydrogen plans to demonstrate integrated refrigeration, zero-loss flexible term storage of liquid hydrogen, and densified hydrogen handling techniques. The Florida Solar Energy Center has partnered with the KSC researchers to develop thermal performance prediction model of the GODU for LH2. The model includes integrated refrigeration cooling performance, thermal losses in the tank and distribution lines, transient system characteristics during chilling and loading, and long term steady-state propellant storage. This paper will discuss recent experimental data of the GODU LH2 system and modeling results.

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