

SCALE MODEL THRUSTER ACOUSTIC MEASUREMENT RESULTS

The Space Launch System (SLS) Scale Model Acoustic Test (SMAT) is a 5% scale representation of the SLS vehicle, mobile launcher, tower, and launch pad trench. The SLS launch propulsion system will be comprised of the Rocket Assisted Take-Off (RATO) motors representing the solid boosters and 4 Gas Hydrogen (GH2) thrusters representing the core engines. The GH2 thrusters were tested in a horizontal configuration in order to characterize their performance. In Phase 1, a single thruster was fired to determine the engine performance parameters necessary for scaling a single engine. A cluster configuration, consisting of the 4 thrusters, was tested in Phase 2 to integrate the system and determine their combined performance. Acoustic and overpressure data was collected during both test phases in order to characterize the system's acoustic performance. The results from the single thruster and 4-thruster system are discussed and compared.