

Scale Model Acoustic Test Validation of IOP-SS Water Prediction using Loci-STREAM-VoF

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The Scale Model Acoustic Test (SMAT) is a 5% scale test of the Space Launch System (SLS), which is currently being designed at Marshall Space Flight Center (MSFC). SMAT consists of a 5% scale representation of the ignition overpressure sound-suppression system (IOP-SS) that is being tested to quantify the water flow and induced air entrainment in and around the mobile launcher exhaust hole. This data will be compared with computational fluid dynamics (CFD) simulations using the newly developed Loci-STREAM Volume of Fluid (VoF) methods. Compressible and incompressible VoF methods have been formulated, and are currently being used to simulate the water flow of SMAT IOP-SS. The test data will be used to qualitatively and quantitatively assess and validate the VoF methods.