

Frequency-Based Spatial Correlation Assessments of the Ares I Subscale Acoustic Model Test Firings

The Marshall Space Flight Center has performed a series of test firings to simulate and understand the acoustic environments generated for the Ares I liftoff profiles. Part of the instrumentation package had special sensor groups to assess the acoustic field spatial correlation features for the various test configurations. The spatial correlation characteristics were evaluated for all of the test firings, inclusive of understanding the diffuse to propagating wave amplitude ratios, the acoustic wave decays, and the incident angle of propagating waves across the sensor groups. These parameters were evaluated across the measured frequency spectra and the associated uncertainties for each parameter were estimated.

R.J. Kenny, NASA, Huntsville, AL; J. Houston, Jacobs Engineering, Huntsville, AL