

Impact of Drift on the Vehicle Liftoff Acoustic Environments

During liftoff a vehicle can drift due to wind, nozzle gimbaling, fly away maneuver, etc... This drift can cause the exhaust plumes to impinge on the deck and cause the noise levels experienced by the vehicle to increase. A small increase in the plume impingement can have a dramatic effect on the noise levels when the vehicle is only a few nozzle diameters from the deck. As the vehicle lifts off the deck the increase in noise levels lessens as the plume impingement increases. Several scale model acoustic tests have been undertaken at Marshall Space Flight Center which had test cases that were used to define the relationship between drift and the noise levels experienced by the vehicle.