

## VUV FLUORESCENCE OF WATER & AMMONIA FOR SATELLITE THRUSTER PLUME CHARACTERIZATION.

JUSTIN W. YOUNG, CHRISTOPHER ANNESLEY, RYAN S BOOTH, JAIME A. STEARNS, *Space Vehicles Directorate, Air Force Research Lab, Kirtland AFB, NM, USA.*

A quantified description of photoemission from thruster plume species, such as water and ammonia, is necessary for complete characterization of a thruster plume. Photoemission in a plume is due to excitation of molecular species from solar photons. For instance, electronic excitation of water with Lyman-alpha (121.6 nm) causes dissociation to the OH radical by following one of several possible pathways. One pathway leads to an electronically excited OH radical which fluoresces near 300 nm. Here, four-wave mixing is used to generate vacuum ultraviolet photons to excite a plume species seeded in a jet expansion. The resulting fluorescence is analyzed and used to describe the temperature dependence of the fluorescence signature.