Evaluating the influence of particulate matter on spectroscopic measurements of a combusting flow[1] JONATHAN HERLAN, NATHAN MURRAY, The University of Mississippi - NCPA — An adiabatic table-top burner has been used to develop a method for estimating the temperature and concentration of OH in a measurement volume of a non-premixed, hydrogen-air flame. The estimation method uses a nonlinear curve-fitting routine to compare experimental absorption spectra with a model derived, using statistical mechanics, from the Beer-Lambert law. With the aim of applying this method to the analysis of rocket exhaust plumes, this study evaluates whether or not it provides faithful estimates of temperature and OH concentration when the combusting flow contains particulate matter—such as soot or tracers used for particle image velocimetry (PIV) measurements. The hydrogen line of the table-top burner will be seeded with alumina, Al_2O_3, particles and their influence on spectroscopic measurements elucidated.

Jonathan Herlan
The University of Mississippi - NCPA