

Upper Limits for Coma Emissions Near Perihelion as Measured by *Rosetta*'s Alice Ultraviolet Spectrograph

Brian A. Keeney¹, S. Alan Stern¹, Ronald J. Vervack, Jr.², John Noonan³, Joel Wm. Parker¹, Jean-Loup Bertaux⁴, Lori M. Feaga⁵, Paul D. Feldman⁶, Matthew M. Knight⁵, Andrew J. Steffl¹, Harold A. Weaver²

¹Southwest Research Institute, Boulder, CO 80302, USA, ²Johns Hopkins University Applied Physics Laboratory, Laurel, MD 20723, USA, ³Lunar and Planetary Laboratory, University of Arizona, Tucson, AZ, 85721, USA, ⁴LATMOS, CNRS/UVSQ/IPSL, 78280 Guyancourt, France, ⁵Department of Astronomy, University of Maryland, College Park, MD 20742, USA, ⁶Department of Physics and Astronomy, Johns Hopkins University, Baltimore, MD 21218, USA

Part of taking the inventory of comet constituents is setting limits on what could have been detected, but was not. The Alice far-UV imaging spectrograph (700-2100 Å) took over 70,000 integrations during *Rosetta*'s 2-year escort mission, including over 10,000 in the 90 days surrounding the perihelion passage of 13 August 2015, when the comet activity level was highest. We have developed automated software to fit and remove ubiquitous H, O, C, S, and CO emissions from Alice spectra, along with backgrounds from reflected solar continuum and absorption from gaseous H₂O in the comet's coma, which we apply to a grand sum of the integrations taken within 90 days of perihelion. We present sensitive limits on the presence of ~20 undetected species, including the noble gases Ar and Xe, relative to H₂O for this time period, and compare them to results obtained by other *Rosetta* instruments when possible.