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CRDS Measurements of Radiation-Induced Atmospheric Products[1] SIDNEY GAUTRAU, TYLER REESE, PATRICK ABLES, CHRIS WINSTEAD, University of Southern Mississippi — The purpose of this project is to validate computational models under development for radiation-induced atmospheric effects. Cavity Ringdown Spectroscopy (CRDS) is used to measure the concentration of chemical products generated as a result of radiation interactions in a controlled atmosphere. Experiments are conducted in a vacuum chamber interfaced with a gas introduction system used for control of the initial atmospheric composition, which in turn is confirmed using a quadrupole mass spectrometer. A tunable dye laser provides wavelength flexibility for detection of a variety of chemical products generated by radiation sources mounted at the center of the vacuum chamber. CRDS measurements are to be performed under a variety of atmospheric and radiation conditions for validation of modelling results. This poster briefly explains the advantages of using CRDS for these measurements and includes a description of the modifications required to enable the use of an existing vacuum system with the mass spectrometer and the dye laser systems. Experiments conducted for calibration of the CRDS system are outlined and alpha radiation-induced ozone measurements are presented for an N_2/O_2 mixture with different initial O_2 concentrations and radiation source activities. Future work will include measurements of other anticipated species such as NO, NO_2, and HNO_3.

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