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Measurement of the Absolute Concentration of Molecular Oxygen in a Capacitively-Coupled RF Discharge in a Martian Simulant Gas[1]
GEORGE BROOKE, Department of Physics and Astronomy, Virginia Military Institute, Lexington VA 24450 — We will be presenting the results of an experiment to measure the absolute concentration of molecular oxygen in a capacitively-coupled RF discharge in a Martian simulant gas using cavity ring-down spectroscopy (CRDS). The goal of this work is an efficient, low-power oxygen generator for use on the surface of Mars. Previous experiments have demonstrated the ability to produce and extract molecular oxygen using an RF discharge but were unable to measure the absolute concentration within the discharge volume. Using the CRDS technique we have measured the absolute concentration of molecular oxygen in the discharge with respect to RF power and two different electrode configuration (planar and solonoidal) at a fixed pressure of 5 Torr.

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