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1P63 - Spectroscopic investigation of air excited and ionized by an electron beam*

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Plasma chemistry induced in air by an electron beam is being studied at the Naval Research Laboratory. An electron beam is produced in vacuum using a Febetron pulsed-power generator modified to produce a peak voltage of 80 kV, a peak current of 4 kA, and a pulse width of 100 ns. The beam then passes through a thin anode followed by a thin pressure barrier into a cavity filled with low-pressure dry air. Visible and near-ultraviolet spectral lines are used to diagnose the presence of excited and ionized states induced as the beam transits the air. The time dependence of these excited states at different pressures is compared with the electron density and current within the cavity, as well as framing camera images of the visible emission.

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Authors: JACKSON, S. L. (Plasma Physics Division, Naval Research Laboratory); HINSHELWOOD, D. D. (Plasma Physics Division, Naval Research Laboratory); SWANEKAMP, S. B. (Plasma Physics Division, Naval Research Laboratory); PETROVA, Tz. B. (Plasma Physics Division, Naval Research Laboratory); Dr GIULIANI, J. L. (Plasma Physics Division, Naval Research Laboratory); Dr RICHARDSON, A. S. (Plasma Physics Division, Naval Research Laboratory); Dr ADAMSON, P. E. (Plasma Physics Division, Naval Research Laboratory); Dr SCHUMER, J. W. (Plasma Physics Division, Naval Research Laboratory)

Presenter: JACKSON, S. L. (Plasma Physics Division, Naval Research Laboratory)

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