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Emulating microwave-induced breakdown in air with trigatron spark gap B. LENARDO, C.A. ROMERO-TALAMAS, V.L. GRANATSTEIN, G.S. NUSINOVICH, University Of Maryland, College Park, MD 20742 — A spark gap and power supply have been constructed to emulate the duration and energy dissipation of air breakdown induced by a 670GHz gyrotron beam, a source that our group plans to use to explore remote detection of concealed radioactive materials. The spark gap is being used in calibration and testing of diagnostics, including atomic line spectroscopy, mass spectrometry, and microwave scattering. The power supply accepts a variable high voltage input up to 5 kV, stores energy in a 1.8 microfarad capacitor, and arcs across a gap of 1.34 mm. The gap is triggered by a AA-battery powered piezoelectric igniter available commercially (used in common gas grills). Preliminary results show that for a charging voltage of 3 kV, we are able to trigger a spark with energy 1.78 ± 0.23 Joules lasting approximately 2 microseconds, values which can be tuned by varying resistance and charging voltage of the discharge circuit. Our goal is to dissipate 3 Joules in 10 microseconds, which we expect to see in the gyrotron beam breakdown.

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