

Abstract Submitted
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**Electron-Beam Generated Air Plasma Measurement Details:
I/Q Detector and Effect of Reduced Electric Field**¹ ROBERT VIDMAR,
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Technologies and Research — An in-phase (I) and quadrature (Q) microwave de-
tector operating at 10 GHz is used to measure the electron number density and
momentum-transfer collision rate of air plasma as a function of pressure from 1 mT
to 636 T and reduced electric field. Raw measurements from the I/Q detector and
the method to convert such measurement into electron number density and momen-
tum transfer collision rate are discussed. Optical emissions at 391.4 nm from N_2^+ are
used to quantify the volumetric ionization profile along the microwave propagation
path. At low pressure a MAGIC code calculation provides the relative ionization
profile. Results of electron number density and momentum-transfer collision rate
are shown as a function of reduced electric field and pressure.

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