

Abstract Submitted
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Resonant element microwave plasma source. BARTON LANE, PETER VENTZEK, Tokyo Electron America, AMIT BHAKTA, None — We present here a new concept for plasma generation which employs the near fields from resonant metal structures to sustain a plasma. These structures are embedded in ceramic using a lamination technology and thus allow compatibility with corrosive chemistries. The structures can be viewed as LC circuits which a number of resonances corresponding to different electric field eigenmodes. These correspond to different polarizations of the fields which penetrate into the plasma region. The frequency band determines the approximate scale of the resonant structures and we present a proof of concept experiment in the microwave band. The inductive part of the structure corresponds to the portion of the standing wave fields where the magnetic field is the strongest. We position this near the plasma so that the changing magnetic fields penetrate into the plasma region. The microwave currents are arranged to be parallel to the alumina – plasma interface so that the induced electric fields are parallel to the plasma sheath. For the microwave frequency band the structures had dimensions of approximately 10 mm and produced plasmas of a similar size.

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