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Fluid simulations of plasma-based microwave power limitation<sup>1</sup> ANTOINE SIMON, ISAE, University of Toulouse, GERJAN HAGELAAR, THIERRY CALLEGARI, LAURENT LIARD, OLIVIER PASCAL, LAPLACE, CNRS and University of Toulouse, ROMAIN PASCAUD, ISAE, University of Toulouse — This paper presents numerical simulations of an experimental plasmabased power limiter for microwave transmission lines, aiming to protect receiver systems from high power microwaves. The system under study features a microstrip transmission line immersed in 10 Torr argon gas, coupled with a micro-hollow cathode discharge sustaining a certain level of pre-ionization at a given point along the line, which enables rapid ignition of a protective plasma discharge as soon as the microwave power exceeds a certain limit of the order of 1 W. The formation of this plasma discharge and its effect on the microwaves are simulated self-consistently using a 2D multi-fluid code including Poisson's equation and a microwave simulation module. The simulation results are compared with various electrical and optical measurements, and help to interpret these experimental data.

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