GLOBAL MODELS FOR THE MICROWAVE DRIVEN DOUBLE ICP PLASMA JET*

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For many technical applications, microwave driven plasma jets are possible alternatives to conventional RF plasma sources. They are of uncomplicated construction, and have the advantages of small size and large electrical efficiency.

The microwave driven double ICP plasma jet is a recently developed variant. The core of the device is a cavity resonator with a resonance frequency of ~2 GHz. In good approximation, the resonator can be described as a circuit of two cylindrical one-turn coils parallel to a planar capacitor. Inside the coils are ceramic tubes which contain the plasma. (See fig. 1.)

The contribution will present two models of the configuration. An “ignition model” assumes an unperturbed vacuum field and allows studying the ignition of the device. A complementary “operation model” is based on an approximate representation of the field as modified by the plasma and describes the jet in stationary operation. For both models, a comparison of the simulation results with experimental data is performed.


* Supported by Deutsche Forschungsgemeinschaft DFG