EXPERIMENTAL INVESTIGATION OF THE THRUST PERFORMANCE OF ATTILA
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Abstract
In order to enlarge the performance of plasma thrusters, for example arc-jet or self-field MPD-thrusters, a new kind of plasma thruster is developed at IRS. ATTILA¹ [1,2] combines the advantages of thermal arc jets and self-field MPD thrusters, especially their relatively simple setup, and the reliability of a radio frequency power supply, which is usually used for surface hardening. The plasma jet generated by the thermal arcjet section, which is operated in a power range between 50 to about 100 kW, is injected into a ceramic tube which is surrounded by a magnetic coil. In this stage additional energy is added by inductive heating. It was shown [1,2] that it is possible to operate DC-plasma thrusters and an induction heated plasma source simultaneously. During a first phase ATTILA was operated against atmospheric pressure. As a second step the new thruster was installed in a vacuum tank. Figures 1 and 2 show the thruster operating under vacuum conditions. It was proved that in the second stage a significant increase of the specific power can be achieved.

Fig. 1: ATTILA operating in arc-jet mode
Fig. 2: ATTILA operating with superposed induction heating

The paper will describe the experimental setup of ATTILA. Additionally different methods to determine the thrust of the new plasma thruster will be applied.

Literature

¹ ATTILA-ADJUSTABLE THROTTLE INDUCTIVELY AFTERBURNING ARC JET