

SPACE PROPULSION SYMPOSIUM (C4)
Electric Propulsion (4)

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ELECTRIC PROPULSION IN GERMANY: SYSTEM ACTIVITIES, STATUS OF THE HEMP
THRUSTER DEVELOPMENT, CHALLENGES COMING UP**Abstract**

The development of the HEMP (High Efficiency Multi Stage Plasma) technology for Electric Propulsion (EP) started in 1998. A complete assembly including thrusters, power supply and control, flow control, harness etc. was ordered by the German Aerospace Center - Space Administration - to integrate and fly it on a telecom satellite. The Qualification Models are following the qualification processes now and the assembly is planned to be launched on a telecom satellite. Furthermore, new satellite buses with higher power levels and the idea of using EP for orbit raising require higher ISP and thrust. Further developed HEMP- thrusters could meet the requirements of those missions and could be used for those mission profiles as well. The technology has to be developed further for higher power levels, higher voltage, longer operation times. DLR Space Administration has been supporting research and development of new technologies for EP at companies and universities. During the past years a profound infrastructure containing research, development and education has been evolved to make possible cutting edge technologies for electric thrusters, their subsystems, diagnoses and modeling. But more flight heritage is necessary. It is planned to present the existing technologies to meet the requirements of future telecom-satellites, including technologies for the required subsystems, the test facilities and successful computation of the HEMP- plasma and plasma- wall interactions in the test chamber. The status of the development of the HEMP thrusters and the validation status will be the main part - it has become reality.