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Hyper-velocity impact experiments with electrostatic dust accelerators ANNA MOCKER, IRS, University of Stuttgart, THOMAS AUST, Steinbeis Transferzentrum Raumfahrt, Stuttgart, SEBASTIAN BUGIEL, IRS, University of Stuttgart, JONATHAN HILLIER, CAPS, University of Kent, KLAUS HORNUNG, Universitaet der Bundeswehr, Munich, YAN-WEI LI, HEIKO STRACK, IRS, University of Stuttgart, SRAMA RALF, University of Stuttgart and MPI for Nuclear Physics, Heidelberg — Hypervelocity impacts (HVI) of micrometer-sized particles play an important role in a variety of fields such as the investigation of matter at extreme pressures and temperatures, shock waves in solid bodies, planetology and cosmic dust. The physical phenomena occurring upon impact are fragmentation and cratering, shock waves, the production of neutral and ionized gas, and light flashes. Advanced analysis techniques promise new insights into short time-scale high-pressure states of matter, requiring the production of high speed projectiles. Electrostatic accelerators act as a source of micrometer and sub-micrometer particles as projectiles for HVI experiments. This paper describes an HVI facility, capable of accelerating particles to over 100 km/s, currently located at the Max Planck Institute for Nuclear Physics in Heidelberg, together with planned improvements. The facility is about to be relocated to the University of Stuttgart. This is an opportunity to enhance the facility to meet the requirements of future experimental campaigns, necessary to better understand the micrometeoroid hypervelocity impact process and develop new in situ dust experiments. We will present the design of the new facility and the planned enhancements, including new diagnostic apparatus.

Anna Mocker
IRS, University of Stuttgart, Germany

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