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Applied Impact Physics Research

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Applied impact physics research is based on the capability to examine impact processes for a wide range of impact conditions with respect to velocity as well as mass and shape of the projectile. For this reason, Fraunhofer EMI operates a large variety of launchers that address velocities up to ordnance velocities as single stage powder gun but which can also be operated as two-stage light gas guns achieving the regime of low earth orbital velocity. Thereby for projectile masses of up to 100 g hypervelocity impact phenomena up to 7.8 km/s can be addressed. Advanced optical diagnostic techniques like microsecond video are used as commercial systems but - since impact phenomena are mostly related with debris or dust - specialized diagnostics are developed in-house like x-ray cinematography and x-ray tomography. Selected topics of the field of applied impact physics will be presented like the interesting behavior of long rods penetrating low-density materials or experimental findings at hypervelocity for this class of materials as well as new x-ray diagnostic techniques.