Angular Distribution of Hypervelocity Impact Plasma  
by  
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The space environment contains many hazards to spacecraft. Meteoroids, which are a component of the space environment, travel up to 72.8 km/s and can strike satellites and space vehicles. Upon impact, both projectile and spacecraft materials vaporize and ionize, resulting in an expanding plasma that may interfere with onboard sensors and equipment. These hypervelocity impacts have potentially been the source of unexplained electronic anomalies. To verify and understand this phenomenon, hypervelocity impact experiments were conducted at the Max Planck Institute for Nuclear Physics in Heidelberg, Germany in 2011. Using their Van de Graaff dust accelerator and vacuum chamber, iron dust particles were accelerated at representative spacecraft material targets while a suite of sensors measured impact plasma properties. Among these sensors are array of charge collecting plates, termed Faraday plate arrays, positioned to describe the plasma’s translational and angular distributions. Analysis of these data shows characteristics that are dependent on material type and charge.