



Status Report of Development of In-situ Dust Sensor

Yukihito Kitazawa (1,2,5), Haruhisa Matsumoto (2), Akira Sakurai (3), Toshiya Handa (4), and Sunao Hasegawa (5)

(1) IHI Corporation, Space Development Department, Tokyo, Japan (kitazawa@planeta.sci.isas.jaxa.jp, +81 36204 8799), (2) JAXA, (3) Institute for Q-shu Pioneers of Space, (4) Kyushu University, (5) ISAS/JAXA

The importance of measuring dust particles (larger than 100 μm) has increased, especially from engineering viewpoints (e.g. space system design). However, it is difficult to measure the impact flux of these large particles because of the low spatial density of large particles. Sensor systems to monitor these sizes must have a large detection area, while the constraints of a space environment deployment require that these systems be low in mass, low in power, robust and have low telemetry requirements. The in-situ measurement data are useful for; 1) verifications of meteoroid and debris environment models, 2) verifications of meteoroid and debris environment evolution models, 3) real time detection of unexpected events, such as explosions and/or collisions on an orbit. JAXA has been developing a simple in-situ sensor to detect dust particles ranging from a hundred micrometers to several millimeters. Multitudes of thin, conductive strips are formed with fine pitch on a thin film of nonconductive material. A dust particle impact is detected when one or more strips are severed by the perforation hole. The sensor is simple to produce and use and requires almost no calibration as it is essentially a digital system. This presentation reports the development status of the sensor, mainly environment tests and hypervelocity experiments on BBM models.