Development of the Impact Flash Dust Detector: Part1 -- Its Quantification and Feasibility --

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For the interplanetary explorations or non-sample return missions, it is important to receive the material scientific information of the minor bodies. In this study, we are developing the new dust detector with impact flash phenomenon which also enables to use in so harsh thermal and plasma environment. Our objective is to determine the impactors' chemical composition by spectroscopy. Here we performed the experiments using a two-stage light-gas gun at ISAS and a van de Graaff at HIT accelerator with alumina, glass and silver bead projectiles, and silica aerogel targets. We measured the impact flash by photo-multi-plier tubes and discuss quantitatively the relation between impact flash (intensity and duration) and impactors' velocities / size.