

Current Status of Spaceborne Observation of the Interplanetary Dust

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We present a current status of observations of the interplanetary dust based on ASTRO-F/AKARI, PLANET-C, and TOPS missions.

Studies on the origin and the evolution of the solar system is stepping into a new era, since we now have various samples of extra solar systems, and also Vega like stars. The present picture of the solar system, as a template for others, is getting definitely important to be handled. There are large and small bodies in the system and also more objects such as comets and dust particles, but we do NOT fully understand the linkage among them yet. Mechanism of continuous supply of interplanetary dust particle is still in the haze of the solar system.

We have conducted ASTRO-F/AKARI scanning observations of IPD to reveal its morphology, which reflects its origin, and spectroscopic observations to analyze its attribute. The sensitivities, spatial resolution, and calibration stability of ASTRO-F/AKARI will improve the detection level of very fine and faint structures in the interplanetary dust.

PLANET-C mission, which is scheduled to be launched in 2010, will give us a unique opportunity to observe the zodiacal light from various viewing points in the solar system without any contaminations of sky light, and will map the spatial distribution of the zodiacal dust cloud along the heliocentric distance, the resonance structures, the local emissivity, and small clumps of the cloud complex. "IR2" camera onboard PLANET-C is designed to observe faint zodiacal light, and is given very stable response.

TOPS is a small satellite mission employing an extreme ultraviolet spectrometer, and is scheduled to be launched in 2012. The wavelength coverage of TOPS is effective to observe a time variation of CO gas around a cometary coma, which we have difficulty to observe at the radio wavelength. A wide field camera with polarimeter is under consideration to be loaded on TOPS aiming polarimetric imaging of the interplanetary dust.