

Japanese Future Magnetospheric Satellite Mission "SCOPE"

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A formation flight satellite mission "SCOPE" is now under study aiming at launching in 2014. "SCOPE" stands for 'cross Scale COupling in Plasma universE'. The main purpose of this mission is to investigate the dynamic behaviors of plasmas in the Terrestrial magnetosphere that range over various time and spatial scales. The basic idea of the SCOPE mission is to distinguish temporal and spatial variations of physical processes by putting five formation flight spacecraft into the key regions of the Earth's magnetosphere. The formation consists of one large mother satellite and four small daughter satellites. Three of the four daughter satellites surround the mother satellite 3-dimensionally maintaining the mutual distance that ranges between 5km and 5000km (variable). The fourth daughter satellite stays near the mother satellite with the distance between 5km and 100km. By this configuration, we can obtain both the macro-scale and micro-scale information about the plasma disturbances at the same time. It is essential for the daughter satellites to be as small, and as light-weight as possible while maintaining the high performance. According to our consideration, we can fabricate the daughter satellite that weighs about 95kg, including 15kg of science instruments and a propulsion system that maintains the satellite formation, as well as basic common instruments required for an independent satellite.

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Figure 1. SCOPE mission