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The SCOPE mission

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SCOPE is a space plasma physics mission that consists of five spacecraft and that will perform simultaneous multi-scale observations of dynamic space plasma phenomena. The target processes are shocks, reconnection and turbulence. The orbit is $\sim 10 \times 30$ Re in the earth's magnetosphere and in the solar wind, which allows the spacecraft to encounter and us to study these physical processes of fundamental importance. The simultaneous multi-scale observations are performed by a pair of mother-near-daughter (M-ND) spacecraft and the formation of three far-daughter (FD) spacecraft that surrounds the spacecraft pair. The M-ND pair with small inter-spacecraft distance will zoom-in to the electron dynamic scale while the FDs, located at larger distances, will observe the larger-scale (ion- and MHD-scales) dynamics that surrounds the key micro-region observed by the M-ND pair. The mission is planned to have substantial international contributions. In this talk, we will summarize the recent progress of the mission study. Expectations of space plasma simulations from the SCOPE's point of view are also described, with the intention of enhancing the ties between the mission study and the space plasma physics research via simulation.

Keywords: SCOPE, Multi-scale physics, Large-scale particle simulations