

## The SCOPE mission: Its scientific targets and the mission enabling technologies

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The SCOPE mission is a mission that investigates the cross-scale couplings in dynamic magnetospheric phenomena. Its ultimate goal is to provide the framework for understanding not only magnetospheric dynamics but space plasmas in general. It is a multi-spacecraft mission that enables us to grasp the spatial structures of mesoscales (100-3000 km). The main spacecraft has the capability of resolving the electron scales (10 msec time resolution) that enables us to identify the coupling of the dynamics down to the minimum scale, which is indeed essential for true understanding of collisionless plasma dynamics. Planned to be launched in 2012, SCOPE will be in joint with the NASA MagCon mission focusing on larger spatial scales, which combination allows us to cover for the first time full scales of magnetospheric dynamics, the global monitor by MagCon and the monitor by SCOPE on the critical process in the critical region mediated by coupling between MHD and the electron scales. The instruments aboard SCOPE will cover full energy ranges that are required to understand how non-thermal particles are produced in the course of dynamic phenomena. SCOPE will measure electric and magnetic fields precisely so that field-particle interaction will become clearly visible. As such, the SCOPE mission requires substantial new technologies, in terms of scientific instruments as well as in terms of astronautics. We will discuss how these new developments will be made.