

DuneXpress: Dust Astronomy with Dune and ConeXpress

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We present a mission scenario to implement the Cosmic Dune mission concept (Cosmic dust measurements near Earth) using the ConeXpress platform developed by Dutch Space. We discuss the different strategies for the instrument integration on-board the platform and present a preliminary mission design.

Goal of the mission is to reach the Sun-Earth Lagrange point L2. As ConeXpress is propelled with ion engines, a mission design inspired from the Smart 1 mission is developed. The ConeXpress spacecraft benefits of launch opportunities as secondary payload on-board an Ariane 5 rocket and is injected into a classical geostationary transfer orbit (GTO). Starting from this parking orbit, the mission scenario is divided in 3 phases. The first phase consists in raising the orbit perigee as quick as possible up to 20000 km to minimize the spacecraft exposure to the Van Allen radiation belt. During the second phase, the perigee altitude is kept constant, while the apogee altitude is raised up to the Moon's orbit distance. The third phase consists in a Moon swing-by, which injects the spacecraft into a Halo orbit around the Lagrange point L2.