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METNET - atmospheric science network for Mars

A.-M. Harri (1), R. Pellinen (1), M. Uspensky (1), T. Siili (1), V. Linkin (2), A. Lipatov (2), H. Savij\"{a}rvi (3), V. Vorontsov (4), A. Ivankov (4)

(1) Finnish Meteorological Institute, Helsinki, Finland, (2) Russian Space Research Institute, Moscow, Russia, (3) University of Helsinki, Finland, (4) Babakin Space center, Moscow, Russia

A new kind of planetary exploration vehicle for Mars is being developed. The MetNet mission to Mars is based on a new semi-hard landing vehicle called Mars Meteorological Lander (MML). The scope of the MetNet Mission is eventually to deploy several tens of MMLs on the Martian surface using inflateable descent system structures. The MML will have a versatile science payload focused on the atmospheric science of Mars. Detailed characterisation of the Martian circulation patterns, boundary layer phenomena, and climatological cycles requires simultaneous in-situ meteorological measurements from networks of stations at the Martian surface. The scientific payload of the MetNet Mission encompasses separate instrument packages for the atmospheric entry and descent phase and for the surface operation phase. For the descent phase an imager, accelerometers and devices for free flow pressure and temperature observations are envisaged. At the Martian surface the MML will take panoramic pictures, and perform measurements of pressure, temperature, humidity, wind direction and speed, as well as atmospheric optical depth.

The MetNet prototype has been developed and the critical subsystems have been qualified for Martian environmental and functional conditions. Presently a suborbital test launch is under preparation to test the descent systems of the MetNet. The first mission step in the MetNet Mission is to have a MetNet Precursor Mission with a few MMLs deployed to Mars. The MetNet -type of mission is what the Martian atmospheric science currently needs. Detailed characterization of the Martian atmospheric circulation patterns and climatological cycles requires simultaneous in situ atmospheric observations by a network of stations at the Martian surface. The MetNet mission will provide the logical next mission tool in the field of Martian atmospheric science.