

Gravitational Perturbation Measurements in Martian Orbit

Objective: To conduct gravitational field measurements in Low Martian Orbit and perturbations due to Phobos and Deimos (Martian moons).

System: The P30 and 2U CubeSats shall be deployed in the same orbital planes at different true anomaly and obtain the change in distance and acceleration between CubeSats to calculate the higher order harmonics of the gravitational field.

	P30	2U
System		
Mass	10 kg (without Payload)	<4kg
Power	up to 90 W (deployable panels)	~10-16 W (deployable panels)
Volume	300 x 300 x 300 mm (stowed)	100 x 100 x 213 mm
Mechanism	Compliant Mechanisms for robust reliable deployments	
Key Platform Performance Characteristics		
Attitude Control		
Attitude Control System	Active Control System with Reaction Wheel Control	Active Control System with Reaction Wheel Control
Orbital Maneuvering	Electric Propulsion (higher delta V)	Electric propulsion
Pointing Knowledge, 3σ	<0.03 deg per axis	<0.1 deg per axis
Total pointing accuracy, 3σ	<0.07 deg per axis	<1 deg per axis
Telemetry and Telecommand Payload Downlink	Accommodate S- / X- / Ka- band transmitter with patch antennas Compatible with NEN, SN, DSN	Accommodate S- band transmitter with patch antennas Compatible with NEN, SN, DSN
Payload additional Capabilities		
<ul style="list-style-type: none"> - Prediction of Gravity perturbations required for precision in navigation and landing of future martian spacecraft. - Development of gravity field relationships to determine surface topology and morphology - Measurement of gravity field accelerations using ultra-stable oscillators situated on each spacecraft and data correlation between them to accurately determine gravity gradients in Martian environment 		

