

IAF MATERIALS AND STRUCTURES SYMPOSIUM (C2)  
Space Vehicles – Mechanical/Robotic/Thermal/Fluidic Systems (7)

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HOPE PROBE'S MECHANICAL SYSTEM

**Abstract**

The Emirates Mars Mission (EMM), which is the United Arab Emirates' first interplanetary space mission, is planned to launch an unmanned probe, named Hope probe, to Mars by 2020. The mission will explore the atmospheric dynamics of Mars on global, diurnal, and seasonal scales to provide further understanding of the properties behind Mars' transition from a thick and wet atmosphere to its thin and arid atmosphere observed today. This will be done using 3 instruments 1) Emirates Mars Infrared Spectrometer (EMIRS) 2) The Emirates Mars Ultraviolet Spectrometer (EMUS) 3) The Emirates eXploration Imager (EXI). The Hope probe's mechanical system is composed of a cubic structure which is supported by a central cylinder. The structure accommodates the three EMM main instruments on one side of the panel in a kinematic mount design. The bus components (Battery, CDH, telecom, etc.) are mounted on the opposite side of the payload panel. Furthermore, The solar arrays are mounted on the remaining two sides of the structure's panels. The top and bottom decks accommodate the antennas and propulsion thrusters. The central cylinder holds the whole cubic structure together as well as the 750kg fuel tank. This paper will provide the details of EMM's mechanical structure and how the design was made to meet the different technical and design challenges.