

Origin and evolution of Phobos: Scientific objectives awaiting particle measurements by MMX

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In this presentation, we will present scientific objectives of particle measurements by the Mars Moon eXploration (MMX) mission. The MINE (Magnetic field, Ion and Neutral Experiment) package consisting of five instruments (MSA, MIA, REN, NIMES, and MGF) and MEC (Mars Escaping atmosphere Capturing device) have been proposed as possible payloads of the MMX mission. MINE and MEC would perform particle measurements corresponding to the following three scientific objectives: (1) To obtain indirect information on the Phobos internal structure in order to constrain the origin of Phobos independent of the sample analysis results. (2) To characterize the space environment and the surface features of Phobos, with the intention of comparison with asteroids. (3) To constrain the total amount of atmosphere lost from Mars to space during its history. Details of these three scientific objectives will be presented.

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