Geological characteristics and possible internal structures of Phobos and Deimos

（火星衛星の地質学的特徴と想定される内部構造）

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ABSTRACT

Future mission to martian satellites is now actively discussed by Japanese planetary society. Even though both Phobos and Deimos have been intensively studies through terrestrial observations and spacecraft, which provide important dataset of their appearances and orbital parameters, we consider much are still waited to be explored. For example, while spectral characteristics of these satellites indicate these satellites are similar to C or D type asteroids, their circular and equatorial orbits are difficult to be explained by a hypothesis of captured asteroids. Distributions and morphologies of craters and boulders indicate Phobos experienced collisional history for more than 3 billion years, however, the theoretical study indicate almost all impact ejecta will be redeposited to Phobos (e.g., Ramsley and Head, 2013), that would help burying surface features. In order to understand the origins and evolutional histories of these satellites, in fact, some critical information are lacking. Those include spectroscopic data (especially at around 0.65 and 2.8μm bands), high-resolution surface images, precise gravity field, density variation, and circum-satellites environments. These will be primarily targets for a future mission to these satellites.