

Evidence of hydrated and/or hydroxylated minerals on differentiated asteroid Vesta

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Asteroid 4 Vesta is believed to be a differentiated object with intact internal structure due to its achondritic surface and density. In this presentation, we report 3-micron spectroscopic observations of 4 Vesta. We have detected the presence of a 3-micron absorption feature at about the 1% level on the surface of Vesta at longitudes between 155 degree and 195 degrees. This result indicates that hydrated and-or hydroxylated minerals are present in this region of Vesta; the sources are plausibly fragments of carbonaceous chondrite impactors, solar wind implantation, and accumulation of interplanetary dust. The detection of 3-micron absorption features from 4 Vesta, regarded as the smallest terrestrial planet, may provide information to the origin of volatile materials on other terrestrial planets.