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Author: Ms. Flor López Rodríguez
Geophysics Research Institute, Mexico, florlopezr@yahoo.com.mx

USING GPR TO FIND WATER ON THE MOON AND OTHER CELESTIAL BODIES

Abstract

For years, researchers have been interested in finding water on celestial bodies like the moon or Mars. However, they have used destructive and invasive methods on their environment and therefore, violating the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (1979). For this reason, we propose the use of GPR to find water or other kind of resource. This method is non-invasive and ecological, so it would not affect the environment to be searched. The radar could be mounted on a vehicle like a rover or on a platform in orbit. Its operation range should work at least between 50 and 200 Hz. GPR signals are later analyzed with the wavelet transform, the spectral signatures of the moon's or Mars underground cavities where liquid water might be running are found. Preliminary analysis shows that one might differentiate the GPR signals in which there is only lunar or Martian soil and others in which there might be underground tunnels. This method can be applied to any celestial body and by using acoustic and seismic signals. It also can be used to find any kind of natural resource, in this case, water.