

Search for shallow subsurface structures in Chryse and Acidalia Planitiae on Mars

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Chryse and Acidalia Planitiae (CAP) are known as one of abundant sites of Recurring Slope Lineae (RSL) on Mars that might be potentially due to subsurface icy or briny origin. We surveyed shallow subsurface structures in the CAP regions using data from the Mars SHallow RADar sounder (SHARAD) onboard the Mars Reconnaissance Orbiter (MRO). A total of 27 locations of subsurface reflectors were identified, but no features related to RSL were detected unexpectedly. The detected reflectors do not constitute apparent subsurface structures larger than 30 km. Thus, there is no wide shallow subsurface structures in CAP. The lack of widespread radar returns might indicate the interface between subsurface materials is too thin to be detected or has a gradual or a minimal permittivity contrast. The surveyed area chosen in this study is on lower latitude compared to ice-deposited regions in previous studies. The additional study that searches higher latitude (northern Acidalia Planitia) may conquer the lack of brighter reflectors.

Keywords: Mars, surface, Radar observations