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# Groups and clusters of circular features on Elysium Planitia, Mars: pingos or pseudocraters?

M.A. de Pablo (1) and B.C. Bruno (2)

(1) Dpto. de Geología. Universidad de Alcalá. 28871 Madrid. Spain. (miguelangel.depablo@uah.es), (2) Hawai'i Institute of Geophysics and Planetology, University of Hawai'i. Honolulu, Hawai'i.

Potential pseudocraters (or volcanic rootless cones) have been described in different locations of the Martian lowlands, including Elysium and Utopia Planitiae. Pseudocraters form as a result of lava-water (or lava-ice) interaction. Their existence has important implications for the local hydrological history of Mars and their presence may indicate potential niches for life. On the other hand, some of these circular features have been recently reinterpreted as pingos, especially those located in Athabasca Valles in Elysium Planitia. Pingos have different climatological, geological and hydrological implications than pseudocraters. Therefore, it is important to clearly identify these features in order to gain a greater understanding of the geological history of this region.

We have conducted an exhaustive review of THEMIS and high-resolution MOC images (including images not available in previous publications) in order to locate circular structures that may represent potential pseudocraters or pingos. Our target area is Elysium Planitia. The identification of circular features as pseudocraters or pingos is based both on morphology and spatial distribution, as previous authors have shown that terrestrial pseudocraters and pingos have different spatial distributions that can be quantified by nearest-neighbor statistics. Here, we present the preliminary results of our analysis: (1) an increase in the number of images where possible pseudocraters or pingos are visible in Elysium Planitia; (2) a preliminary classification of these circular structures; (3) a preliminary geostatistical analysis of spatial distribution based on nearest neighbour statistics; (4) a preliminary classification of pingos and pseudocraters; (5) a preliminary location map of both features; and (5) a possible explanation into their geologic context.