

## GRID MAPPING FOR THE STUDY OF GEOLOGIC GRADIENTS ALONG ARABIA TERRA IN THE CONTEXT OF THE EXOMARS 2022 LANDING SITE.

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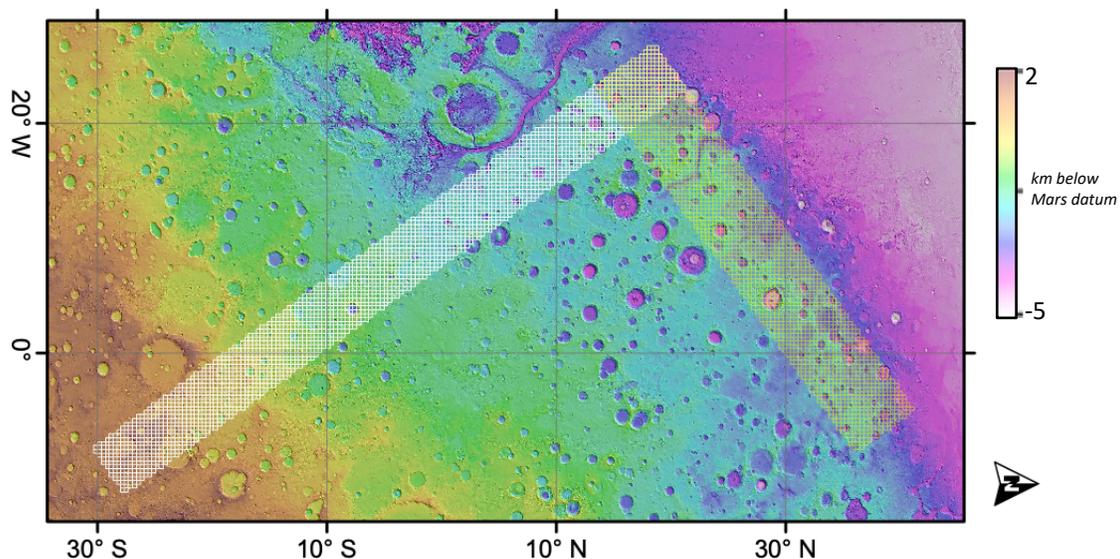
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### ABSTRACT

The geologic context of the proposed ExoMars 2022 landing site, in Oxia Planum at the outlet of Coogoon Valles (Mars), is yet to be fully understood. The area is part of the planetary dichotomy topographic transition in one of the oldest terrains of the planet. Arabia Terra surface is extensively denuded, which resulted in a paucity of valley networks and the presence of many inverted structures [1]. Additionally, the Coogoon Valles system had an extremely complex hydrologic history, and some depressions with uncertain origin can be found [2], similar to hypothesized supervolcanoes [3]. To study the spatial distribution of both the water- and volcanic-related features in Arabia Terra, we performed a grid-based mapping [4,5] in two perpendicular stripes that overlap in the landing site area (squares with 20 km/side, Fig.1). One grid (2171 squares, yellow in Fig.1) follows the dichotomy scarp from the landing site until reaching the plain-style calderas to the northeast [3]. Here we looked for features related to volcanic and thermokarstic activity. The other grid (2563 squares, white in Fig.1) transverses the dichotomy from the landing site southbound to Sinus Sabaeus, where records of fluvial activity are much more prevalent [6]. Here, we looked for modified craters and various water-related features. Some features are found and considered in both grids. We used a global mosaic composed of hi-resolution CTX images [6], a topographic one from MOLA and HRSC data [7], and the quantitative THEMIS-Derived Global Thermal Inertia Mosaic [8].

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**Figure 1:** The two study areas that we used to map the distribution of volcanic (yellow) and water-related (white) feature gradients along Arabia Terra, joining in the ExoMars landing site.