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Coarse-grained ripples in Meridiani Planum

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Coarse-grained ripples are very common features on Mars. These are aeolian sand ridges with surface covered by much coarser particles than they interiors. These forms literally cover Merdiani Planum, an area extensively explored by the Opportunity rover. During its 14 years of investigation Opportunity examined dozen of such bedforms using panoramic and microscopic cameras as well as spectrometers. Using automated methods of data analysis, we were able to characterize materials composing surfaces and interiors of such bedforms. We investigated their morphology and morphometry as well as their orientation. We distinguished several types of such bedforms and proposed a model of their formation and evolution. We also present a comparison of the results based on in situ data to those obtained from orbital data, which will allow for conducting research of such bedforms in locations where in situ data are not available.



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