

Planetary Science Conference

The 5th National Mars Science Seminar
11.10.2024 | <https://mars.uj.edu.pl>

Seasonal Activity of Aeolian Landforms on Mars

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The orientation of aeolian landforms can change when a formative wind direction changes. Such seasonal changes in the wind direction are observed on Mars, but so far no changes in the orientation of aeolian forms have been found in areas studied in situ. In our work, we present results that indicate that such a change in the orientation of aeolian landforms occurs on Mars and has very well described seasonality. In our work, we studied wind streaks and small fine-grained ripples on Meridiani Planum between Mars years 26 and 38 based on orbital and in situ data. Even if the orientation of the studied aeolian landforms indicated the NW winds as the most formative, the aeolian landforms were shaped by the SE winds during summer, while during winter several wind directions played a role in their formation. We also found that aeolian deflation led to complete erosion of smaller dunes and was responsible for the scarcity of fine-grained ripples in this region.