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Mars Exploration – Science, Instruments and Technologies (3B)

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STUDY & PREDICTION OF DUST STORMS IN LOWER MARTIAN ATMOSPHERE USING
EMIRATES MARS INFRARED SPECTROMETER (EMIRS) DATA

Abstract

The Hope Probe of the Emirates Mars Mission is termed as Mars's first true weather satellite as it studies the Martian climate throughout its diurnal and seasonal cycles. The Emirates Mars Infrared Spectrometer (EMIR) is one of the instruments aboard the probe which acquires information about the temperature changes, dust storms, ice clouds, water vapor, ozone, and the thermal structure of the lower Martian atmosphere. The objective of this scientific study is to characterize the dust and analyze temperature variance in the lower atmosphere, thus helping in the prediction of dust storms. EMIR can obtain information over the Martian southern hemisphere by taking multiple images at a resolution of 100-300 km per pixel and a spectral range of 6-40 microns. During summer, Mars is closest to the sun and because of the tilt of the planet, the southern hemisphere is exposed to more radiative heat from the sun. The L2 data received from EMIR will be analyzed using software for spectral analysis. This information on temperature variation will help in identifying the hotter areas of the Martian surface, which are more prone to the formation of dust storms and, thus assist in the prediction of dust storm formation.