



## **The "fair weather" Martian global atmospheric electric circuit**

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There is evidence that Martian dust is readily charged by wind-driven triboelectrification. Adhesion of charged dust to Martian landers is common, and electrostatic discharges generated by charge separation in dust storms appear likely. These discharges may drive a global electric circuit on Mars, similar to the terrestrial atmospheric electric circuit. If this electric circuit exists, a Martian "fair weather" atmospheric electric field can be expected away from the dust storms. On Earth, there is a global universal time variation in the fair weather potential gradient arising from the diurnal variation in thunderstorms across the planet. A comparable Martian diurnal electric field variation can be expected based on the diurnal and spatial variation in dust storms. This fair weather electric field has been estimated from compiled observations of dust storms and electrical charging predictions. Spatial and temporal variability in the Martian global circuit is expected to be substantial, and sources of this variability will also be discussed.