

Stationary flux ropes at the southern terminator of Mars

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Abstract

Flux ropes have long been observed in the upper atmosphere of Venus, and more recently at Mars. Here we present magnetic field measurements of flux ropes encountered at the southern terminator of Mars by Mars Global Surveyor, and compare them to a flux rope model. This allows several parameters of each rope to be inferred. Remarkably similar flux ropes are met repeatedly over a period of the Martian year when strong crustal magnetic fields are upstream of their position on the terminator, indicating that they are most likely stationary and attached to the upstream crustal fields. Possible explanations for the formation of the flux ropes are described.