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A smoke-like phenomenon observed in Elysium Planitia, Mars.

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At 5.74ºN, 169.6ºE in Elysium Planitia, in narrow and wide angle images (E23-00771, E23-00772), acquired by MOC (Mars Orbiter Camera) in December of 2002, we identified an elongated, narrow triangle in shape (about 500 meters wide, as long as 2 kilometers), light-colour smoke-like feature extending towards west. This smoke-like feature, somewhat similar to wind strikes in its appearance, is located in a plain. The feature seems to be real and to originate from a small (about 30 metres wide) semicircular feature, which appears to be a mound with associated multiple crater-like depressions. This smoke-like feature displays relatively sharp edges near the apex where it seems to originate from.

In the surrounding terrain, there are light-colour wind strikes marking the same wind direction towards west. These wind strikes show fuzzy edges compared with the edges of the smoke-like feature. The site of the smoke-like feature is located in a plain south of Cerberus Fossae, a fracture system with associated volcanic activity; and to the north of one of the shield volcanoes that scattered in this region of Mars.

In order to analyze this feature, we study all the data available for this site: Viking, MOC, THEMIS, and HRSC images. Data coverage of this site is poor, and the spatial resolutions of most of the data are too low to show this feature. Due to (1) the proximity of this feature to one of the shield volcanoes that located in Elysium Planitia, (2) the coherent wind direction compared wind streaks in this area, (3) their absence in other (previous and later acquired) images (although we can not totally rule out the possibility that the absence is due to the low spatial resolutions), and (4) the relatively

sharp edges, we propose that this smoke-like feature is an ephemeral phenomenon that was produced by volcanic activity such as fumarole or geyser. These processes could launch dust and gases to the atmosphere. Dust should be moved by the wind horizontally, forming the observed feature. It is also possible that the transported materials were deposited on the ground, and we see the deposit on the ground. The process producing the phenomenon likely occurred after 1980 (it does not appear in Viking images: 385S51, 385S52, and 385S53 acquired in April of 1980).