



## **The electrification of wind-blown sand on Mars and its implications for atmospheric chemistry**

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Wind-blown sand, or 'saltation,' creates sand dunes, erodes geological features, and could be a significant source of dust aerosols on Mars. The electrification of sand and dust in saltation, dust storms, and dust devils could produce electric discharges and affect atmospheric chemistry. We present the first calculations of electric fields in Martian saltation, using a numerical model of saltation that includes sand electrification, plasma physics, and the adsorption of ions and electrons onto particulates. Our results indicate that electric discharges do not occur in Martian saltation. Moreover, we show that the production of hydrogen peroxide and the dissociation of methane by electric fields are much less significant than previously thought. Both these species are highly relevant to studies of past and present life on Mars.