

WIND DRIVEN GRAIN TRANSPORT ON MARS

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Introduction: The wind driven transport of material at the surface of Mars is being actively researched both in laboratory simulators and through surface and orbital probes. Convergence is first now being reached between observation, simulation and theory. Specifically processes are being quantified whereby dust particulates aggregate and become dispersed allowing abundant dust transport at the wind speeds (wind induced surface shear stress) observed, close to the threshold at which solid sand grains become mobilized (1,4,5).

Granular electrification appears to be involved in the aggregation process, this is also being studied in detail both under Mars simulation environment and is still far from being well understood (2).

Dust and wind flow sensing instrumentation will be presented which are being used in a laboratory environment and also developed for forthcoming Mars missions.

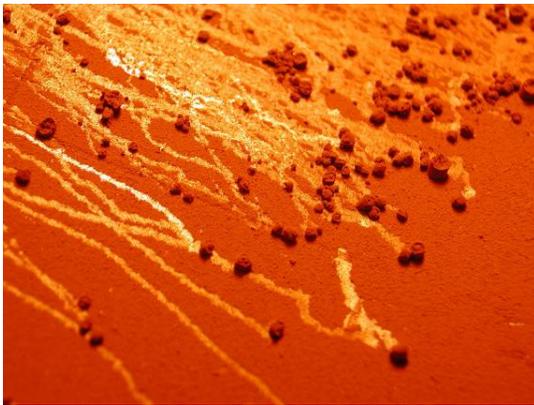


Figure 1. Dust aggregates created under Mars simulation conditions with sizes up to several mm diameter.

Wind Tunnel Simulations: Using unique Mars simulation wind tunnel facilities at Aarhus University, Denmark studies of dust aerosol suspension, deposition and wind induced grain removal are being performed in a controlled environment (3). Further more the effects of applying electric fields and the (micro

scale) electrical properties of Mars analogue dust and sand are being investigated

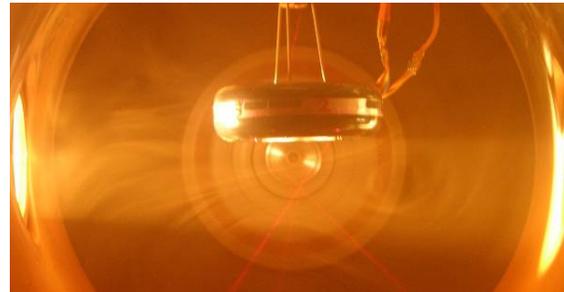


Figure 2 showing suspended dust exposure under simulated Martian conditions.

References:

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