



The Telltale Wind Experiment for the NASA Phoenix Mars Lander 2008

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The Telltale experiment for The Mars Phoenix Lander, landing in Mai 2008, is a lightweight passive wind experiment designed to measure wind velocities at the landing site. It consists of a lightweight Kapton tube hanging in Kevlar fibres (total mass of the active part is of the order of 10 mg) that will deflect as a result of wind forces. Images of the Telltale obtained by the onboard camera (SSI) using long exposure times will give information on the deflection and dynamics that can be related to wind velocities and turbulence.

The Phoenix mission will explore the Martian Arctic to investigate interaction between the atmosphere and volatiles in the surface material. The mission will also try to uncover any possible clues in the Martian Arctic soils about the history of water and potential for habitability. Phoenix is a stationary lander with a scoop that will be used to deliver selected ice/soil samples to onboard experimental equipment in order to determine the physical, chemical and biological characteristics of the sampled material, e.g. the amount of ice in the soil. To ensure an efficient and unbiased delivery of samples to the instruments, some knowledge of daily wind patterns are essential. Wind speed and direction will also allow the analysis of diurnal wind cycle and weather patterns.

We will describe the difficulties involved in the design and construction of a passive

wind experiment for Mars applications, and how these have been resolved. Characterisation data obtained at the wind tunnel of the Mars Simulation Laboratory, Aarhus, are presented as well as predictions of the behaviour of the telltale on Mars. The scientific importance of having wind measurement on the lander will be addressed and also how this will benefit both scientific and operational tasks.