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A miniature laser–based instrument for dust and wind analysis on the Martian surface

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The red dust on Mars is a major environmental factor, affecting the climate, the near surface chemistry/mineralogy and has implications for biological protection and water transport. In order learn more about the physical properties of this dust and how it is transported we have developed a simple miniaturised instrument for direct measurement of dust and wind flow (1). It has the benefit of being a non–contact technique, which is insensitive to properties of the fluid medium and is capable of measuring suspended dust concentration. With the help of a Mars simulation wind tunnel we have collaborated in studies of dust deposition on permanent magnets mounted on the NASA Mars Exploration Rovers (2). Similarly we have now developed an optoelectronic instrument for quantification of dust deposition which, with the use of electric fields, can for the first time study the electrical properties of the Martian dust (3,4). It is suggestedto land the combined dust and wind sensor with the ESA ExoMars mission 2009.

References:

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