



Magnetic properties experiments onboard the Phoenix 2007 Mars Lander

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The Phoenix Lander carries two different magnetic properties experiments: An enhanced sensitivity sweep magnet experiment and the MECA magnetic substrates.

The sweep magnet onboard the Mars Exploration Rovers, Spirit and Opportunity, was designed to evaluate the fraction of non-magnetic particles in airborne dust on Mars. The sweep magnet is ringshaped and therefore only non-magnetic particles can enter the center of the magnet. Preliminary results from the rovers showed that the center was clean and we therefore concluded that all particles in the martian atmosphere are magnetic in the sense that they are attracted to permanent magnets. But can this really be true? We found this hard to believe and we therefore made an enhanced sensitivity sweep magnet experiments for the Phoenix Lander. The enhanced sensitivity sweep magnet consists of six sweep magnets with different colors in the center. The different colors give different contrast to the martian dust and we will therefore better be able to detect particles in the center of the sweep magnets in this experiment.

Since the sweep magnet seems to be able to keep a small area virtually clean of dust, the enhanced sweep magnet experiment also works as a calibration target for the main camera on Phoenix, the Surface Stereo Imager (SSI).

The MECA microscopy sample wheel has several different substrates to collect particles from samples supplied to the MECA instruments by the robotic arm (RA).

Among these substrates are two substrates containing permanent magnets of different strength. Dust collected on the magnets will be examined by optical microscopy and

AFM.

We will give a status on the design, calibration and simulation experiments made on the magnetic properties experiments for the Phoenix Lander.