



Experimental observation of dust grains sputtering

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Space dust is exposed to ion bombardment at nearly every space environment. If ion energies exceed several hundreds of electronvolts, more or less intense sputtering occurs. In the laboratory, only the beam experiments would simulate similar conditions, but ions of these energies can be found even in the solar wind. It is supposed that the sputtering is one of the most important destruction processes of micron-sized dust grains and serve as an important source of heavy species in the interplanetary medium.

Our simulation is based on the quadrupole trap experiment where charged grain is caught. Under ion beam exposure (of energy up to 5 keV) it becomes a subject to sputtering. Since the grain is also charged by this beam a strong electric field near the surface can affect the sputtering process. The small, finite size of grains play an important role in quantification of sputtering efficiency. We use a simple sputtering model for spherical grains and compare its predictions with measurements performed by argon ions on the gold microspheres. Preliminary results indicate that not only the grain mass but also the grain shape are changing in course of a long experiment. We suggest that similar effects can occur in the space if the dust is exposed to collimated ion beams.