



Influence of particle impacts on dust grain properties: electron bombardment

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In various space environments, the dust is exposed to particle bombardment. Under an impact of ions, electrons, and photons, the charge of a particular grain changes and, in some cases, the grain structure can be modified. For this study, we used spherical polymer grains that are often applied in many dusty plasmas and microgravity experiments and followed the influence of the electron beam impact on grain properties. Our laboratory investigation based on levitation of one grain in the quadrupole trap as well as on the SEM techniques has shown that the electron impact can lead to a significant increase of the grain size followed by a relaxation if the electron beam is switched off. The paper discusses changes of electronic properties of the grain material and consequences for its applications in laboratory and space.