



Discharging of dust grains with high-positive potentials

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The research of charging processes of various types of dust grains is important for understanding of the role of dust in dust plasmas in a space as well as in applications. The charging processes include the collection of ions and electrons from the ambient plasma, photoemission, secondary electron emission, and also minor charging processes that are believed to be negligible or interesting under specific conditions: thermo- and electric field emissions. However, ion field emission can limit the maximal positive charge on the dust grain because it is a process when the positive ions leave a surface due to a strong electric field. We analyze many discharging characteristics of various dust grains measured under different conditions (the ion beam energy, ion species, total dose of ion bombarding, a history of dust grain charging, etc.) and found that the discharging current is determined not only by the surface field intensity but it strongly depends on the structure of the grain surface.