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Charging of aggregates in the heliosphere QIANYU MA, VICTOR LAND, LORIN MATTHEWS, TRUELL HYDE, Baylor University — Dust in space environments is often charged by photoelectron emission, collection and recombination of plasma particles, secondary electron emission, thermionic emission and field emission. The relative importance of each charging process depends on the radiation and plasma environment as well as on size and material composition of the grains. Data from spacecraft in situ observations show that Local Interstellar Cloud (LIC) dust particles with masses $> 10^{-17}$ kg most likely have an aggregate structure and consist of smaller particles. We have developed a 3D model for the charging of interstellar aggregate dust particles exposed to solar radiation within the heliosphere. Using a self-consistent iterative approach, the equilibrium charge and dipole moment are calculated for the dust aggregate at different locations of the heliosphere. The deflection of interstellar dust in the magnetic field near the heliopause is investigated. We also examine the porosity effect on the photoelectron emission and secondary electron emission from fluffy aggregates.

Lorin Matthews
Baylor University

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