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Coagulation of dust particles in plasma LORIN MATTHEWS, JORGE CARMONA-REYES, VICTOR LAND, QIANYU MA, KRISTEN DELINE, JONATHAN PERRY, BRANDON DOYLE, TRUELL HYDE, CASPER / Baylor University — Dusty plasmas are found in numerous astrophysical environments. Coagulation of the charged dust changes their interaction with the plasma and affects the subsequent dynamics and evolution of the system. The complex microphysics underlying these processes depends on parameters specific to the ambient environment and the grains themselves. Different charging processes can yield populations of grains which are all charged negatively or charged with opposite polarities. The charge on an aggregate distributes itself over the aggregate's surface which can be approximated theoretically by assuming a multipole distribution. The dipole-dipole charge interactions between aggregates lead to rotations of the colliding grains. Other grain properties also influence the coagulation process, such as the monomer shape or the presence of magnetic material. The morphology of the resultant aggregates affects subsequent coagulation. Porous fluffy aggregates are more strongly coupled to the gas, leading to reduced collisional velocities, and greater collisional cross sections. An overview of the numerical and experimental methods used to study dust coagulation at CASPER will be given.

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