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**DC Dusty Plasma Simulation** JOSHUA BLUMENKOPF, Yeshiva University, STEPHANIE WISSEL, ANDREW ZWICKER, Princeton Plasma Physics Laboratory — We describe the development of simulations of a complex plasma-composed of a low-temperature plasma and dust grains-to be used in comparing the electron, dust and ion interactions in the simulations to the Dusty Plasma eXperiments (DPX) being conducted at the Princeton Plasma Physics Laboratory (PPPL). There are two DPX experiments: a ground-based experiment used to investigate the spontaneous formation of dust acoustic waves and the flight-based experiment that has gone on three flights on NASA’s “Weightless Wonder.” The latter experiment has recently been outfitted with a thermal heater used to generate a thermal gradient in the device. This thermal gradient produces a thermophoretic force on the charged dust grains that counteracts gravity, thereby simulating the flights on the “Weightless Wonder.” We have modified the XOOPIIC code (J.P. Verboncoeur et al., *Comp. Phys. Comm.*, 87, May 11, 1995, pp. 199-211) to simulate the DPX apparatuses by adding a new dielectric particle species and creating additional modules to handle dust by allowing variable charge and deposition currents during the collision phase of the code. Using these simulations, plasma dynamics and dust cloud characteristics are compared with experimental results (C. Udemgba, these proceedings).

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