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Importance of plasma-surface interaction to crater plasma mini-wakes and impact generated plasmas on the Moon[1] MICHAEL ZIMMERMAN, WILLIAM FARRELL, TIMOTHY STUBBS, NASA Goddard Space Flight Center, JASPER HALEKAS, Space Sciences Laboratory, UC Berkeley — Recent progress is reported in understanding two regional plasma processes on the Moon through 2D kinetic simulations including a self-consistent plasma-surface interaction. (1) By direct analogy with the global plasma wake it is thought that crater "mini-wakes" form in permanently shadowed craters. Simulations of mini-wake formation in the vicinity of idealized, shadowed lunar topography are presented, and the importance of surface charging and crater shape in modulating the wake structure and particle fluxes to the surface is highlighted. (2) Laboratory experiments have shown that dust-like meteorite analogs are capable of vaporizing a target surface, creating an impact plasma that undergoes an ambipolar expansion process. The same process is thought to occur during meteorite impacts on the surface of the Moon. Preliminary simulations of impact plasma expansion in the vicinity of a lunar-like, charge-collecting surface are presented, and effects of the plasma-surface interaction are discussed.

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