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Investigations into the control of dust charge in complex plasmas<sup>1</sup> MICHAEL MCKINLAY, EDWARD THOMAS, JR., Auburn University — Because the properties of complex (dusty) plasmas are directly coupled to the properties of the background plasma that the particles are suspended in, they have great potential as highly localized plasma diagnostic tools. However, this potential can be limited by the lack of direct control over the most fundamental of dust properties – the particle charge. Recent experiments at the Auburn University Magnetized Plasma Research Laboratory (MPRL) have found evidence that low power (a few mW) electric fields oscillating at frequencies above the dust-plasma frequency, but below the ion-neutral collision and ion-plasma frequencies, may provide a method of controlling the dust charge without radically altering the properties of the background plasma. Probe measurements and data from video analysis are presented alongside estimates of the change and a theory of the effect of the signals on the charging currents. A second experiment that investigates the possibility of using a controlled application of UV light to modify the dust particle charge in the plasma is also presented.

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