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Dust transport and force equilibria in magnetized dusty DC discharges¹ VICTOR LAND, FOM Institute for Plasma Physics Rijnhuizen, Netherlands, EDWARD THOMAS, JEREMIAH WILLIAMS, Auburn University — In many plasma applications and in plasmas in space dust is present. In both types of plasmas magnetic fields can be present. Dust particles collect ions and electrons and the plasma parameters become very different from those in dust-free plasmas. Magnetic fields change the plasma parameters even more. Electrons gyrate around magnetic field lines. This changes the density and potential profiles in the discharge. Furthermore, these electrons move with the ExB drift. In a DC discharge we used different probes to measure the response of a plasma to the introduction of a magnetic field. We also introduced micrometer sized dust particles and recorded the response of the dust to the change in plasma parameters with different optical techniques. We observed a plasma response in the direction of the ExB drift. The dust particles followed this response, however, this response consisted of an initial fast response, on the ion diffusion time scale, followed by a final slow response. Finally we observed an important role for the ion drag force in the vertical force balance.

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