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Electron Drift Dynamics at the Plasma Boundary Sheath in Magnetized Low Temperature Plasmas[1] DENNIS KRUEGER, JAN TRIESCHMANN, RALF PETER BRINKMANN, Ruhr University Bochum, Germany — Two important examples of magnetized low temperature plasmas are high power impulse magnetron sputtering (HiPIMS) and Hall-effect thrusters. Although being designed for completely different applications, similar features can be identified. Common electric and magnetic field configurations lead to various types of drifts and instabilities. One peculiar phenomenon in such discharges are rotating patterns, sometimes called spokes, which develop under certain discharge conditions. As self-organized symmetry breaking structures, these patterns can only be understood by 3d models. To formulate a consistent 3d model, an appropriate boundary condition at the plasma walls must be utilized. Therefore, we investigate the interaction of magnetized electrons with the plasma boundary sheath by means of a 3d kinetic single electron model. For two different sheath models, a specular reflection model and a more physical Bohm sheath model, we find that the effective outcome, in particular the resulting drifts of the guiding center, are very similar.

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Dennis Krueger
Ruhr University Bochum, Germany

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