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Transverse Force Induced by a Magnetized Wake[1] SCOTT BAALRUD, University of Iowa, TREVOR LAFLEUR, PlasmaPotential — This work considers the evolution of a charged test particle in a strongly magnetized plasma computed from linear response theory; a fundamental problem with direct application to plasma transport, confinement and energy deposition of fusion products, and runaway electron generation. The main result is the prediction of a transverse component of the force on the test particle that is perpendicular to its velocity, but in the plane formed by the velocity and magnetic field vectors. This component is in addition to the usual drag force opposing the velocity. The transverse force arises due to the manner in which the Lorentz force influences the dielectric polarization of the background plasma. This causes an asymmetry about the velocity vector in the induced charge distribution and electrostatic potential in the wake of the test charge. The transverse force is observed to change sign depending on the speed of the test charge. For fast projectiles it causes the angle between the velocity and magnetic field vectors to increase, while for slow projectiles it causes this angle to decrease.

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