Gyrokinetic Fokker-Planck Collision Operator BO LI, DARIN ERNST, MIT — The gyrokinetic linearized full Fokker-Planck operator is obtained for delta-f gyrokinetic simulations, including finite Larmor radius corrections [1]. The new operator is exact within the usual gyrokinetic and Fokker-Planck orderings, and treats collisions between arbitrary masses. Finite Larmor radius (FLR) effects in the collision operator play an important role in plasma turbulence and transport, such as strongly reducing the growth rates of trapped electron modes at short wavelengths [2] and in collisional damping of zonal flows [3], relevant near marginal stability. The FLR terms provide physical dissipation needed to achieve steady state in gyrokinetic simulations [4]. The operator includes both the test-particle and field-particle terms and thus automatically satisfies the conservation properties and Boltzmann's H-theorem.

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