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Number-conserving linear reponse study of low-velocity ion stopping in a collisional magnetized classical plasma HRACHYA B. NERSISYAN, IRadiophysics Ashtarak, CLAUDE DEUTSCH, LPGP UParis XI, A.K. DAS, Dpt Phys UDalhousie, PLASMAG1 COLLABORATION — The results of a theoretical investigation on the low-velocity stopping power of the ions moving in a magnetized and collisional plasma are discussed [1]. The stopping power for an ion is calculated through linear response theory (LRT) with a dielectric function approach. Collisions, leading to a damping of the plasma excitations are taken into account with a number-conserving relaxation time approximation within LRT. In order to highlight the combined effects of collisions and magnetization, we compare analytical and numerical results derived for a nonzero damping and magnetic field to those with none. It is thus demonstrated that collisions remove the anomalous friction obtained previously [2] for collisionless magnetized plasmas at low ion velocities. One of our main goals is to contrast present theoretical results with those derived from a novel diffusion formulation based on the one-component plasma hydromodes respectively framed on target ions and electrons [3].

[1] H.B. Nersisyan, C. Deutsch and A.K. Das, Phys. Rev. E83, 036403 (2011)
[2] H.B. Nersisyan, Phys. Rev. E61, 7022 (2000)
[3] C. Deutsch and R. Popoff, Phys. Rev. E78, 056405 (2008)

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