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Current-density functional theory of the friction of ions in an interacting electron gas. V. U. NAZAROV, Research Center for Applied Sciences, Academia Sinica, Taipei, Taiwan, J. M. PITARKE, Materia Kondentsatuaren Fisika Saila, Zientzi Fakultatea, Euskal Herriko Unibertsitatea, Bilbo, Spain, Y. TAKADA, Institute for Solid State Physics, University of Tokyo, Kashiwa, Japan, G. VIGNALE, Department of Physics and Astronomy, University of Missouri, Columbia, Missouri, USA, Y.-C. CHANG, Research Center for Applied Sciences, Academia Sinica, Taipei, Taiwan — Recently [1], the dynamical contribution to the friction coefficient of an electron gas for ions has been obtained quite generally in terms of the exchange and correlation (xc) kernel of the time-dependent density-functional theory (TDDFT). To implement this approach practically, an efficient approximation, like the local-density approximation (LDA), is needed for the dynamical xc kernel. It is, however, known that the *scalar* xc kernel of the TDDFT is a nonlocal quantity for which the LDA is not only inaccurate, but also contradictory [2]. Here we recast the theory into the terms of the *tensorial* xc kernel of the current-density functional theory [3] in which form the LDA can be applied. Our numerical results are in a considerably better agreement with the experimental stopping power of Al than it has been the case within the LDA to the TDDFT. [1] V.U.Nazarov *et al.*, Phys. Rev. B71, 121106 (2005). [2] G.Vignale, Phys. Lett. A209, 206 (1995). [3] G.Vignale and W.Kohn, Phys. Rev. Lett. 77, 2037 (1996).

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