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Plasmogalvanic Effects due to Spin Angular Momentum of Plasmons MAXIM DURACH, Georgia Southern University, NATALIA NOGINOVA, Norfolk State University — Plasmon drag effect (PLDE) and plasmogalvanic effect (PLGE) are important for numerous applications ranging from coupling of plasmonic and electronic components in a new generation circuitry to electronic detection and sensing of optical signals. They are interesting from the fundamental point of view as a manifestation of momentum and energy transfer in light-matter interactions. Developing the approach of Refs. [1,2], we predict torque applied to metal plasma due to absorption of spin angular momentum (SAM) of surface plasmon polaritons (SPPs), which contributes and modifies PLDE and PLGE in metal nanostructures. This torque is related to the Lorentz force acting on metal electrons in the fields of SPPs found earlier in Ref. [1] and to the PLGE contributions into PLDE predicted in the profile-modulated films in Ref. [2]. As a particular case, we consider the SAM transfer in flat metal films and show that account for torque is necessary even for this simple geometry, since it leads to considerable redistribution of linear momentum transfer in propagating SPPs towards the metal surface. References: [1] M. Durach, A. Rusina, M. I. Stockman, Phys. Rev. Lett 103, 186801 (2009); [2] M. Durach, N. Noginova, Phys. Rev. B 93, 161406 (2016).

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