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Nondipole effects and "drag" of photoelectrons in the calcium vapor[1] VALERIY DOLMATOV, DANIEL BAILEY[2], University of North Alabama
— Nondipole photoelectron angular distributions from atoms, molecules, and solids, used to be ignored when interpreting their photoelectron spectra, have become an ad hoc topic of intensive research in recent years. To the surprise of many, on numerous occasions, they have been found to be comparable to those produced in dipole photoionization. Also, nondipole effects are known to result in "dragging" the photoelectrons along or against the direction of passing photons. This leads to the appearance of electric currents ("drag" currents) in gases. In this work, we demonstrate, firstly, that nondipole photoelectron angular distributions are extremely strong in 3p photoionization of Ca, owing to a discovered giant quadrupole 3s-3d resonance in this atom. Secondly, we show that, as a consequence, the drag current appearing in the calcium vapor, is resonantly increased by several factors in magnitude, changes direction twice within the resonant photon energy region, and is quite measurable. The drag current would be a nice novel subject for advanced experimental studies. We strongly urge them.

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