

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Ultra-Low-Intensity Magneto-Optical and Mechanical Effects in Metal Nanocolloids MATTHEW MOOCARME, The Graduate Center of CUNY, JORGE-LUIS DOMINGUEZ-JUAREZ, LUAT VUONG, Queens College of CUNY — Magneto-plasmonics is a designation generally associated with ferromagnetic-plasmonic materials since such optical responses from non-magnetic materials alone are considered weak. Here, we theoretically analyse, numerically investigate, and experimentally show that there exists a magneto-optical switching behaviour in noble-metal nanocolloids. The response is observable at ultra-low illumination intensities $\leq 1 \text{ W/cm}^2$ with DC magnetic fields $\leq 1 \text{ mT}$. Polarization-dependent nonzero time-averaged plasmonic loops and vortex power flows subsequently produce significant torque on nanoparticles and nanoclusters via dipole-dipole interactions. This work provides a new framework for the dynamical interaction between light polarization, nano-surfaces and material magnetization.

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Date submitted: 15 Nov 2013

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