

Abstract Submitted
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Field dependent enhancement of the magneto-optical Kerr effect by surface plasmon resonance C. CLAVERO, K. YANG, Applied Science, College of William and Mary, J.R. SKUZA, R.A. LUKASZEW, Physics, College of William and Mary — Surface Plasmon Resonance (SPR) is of interest in a variety of applications ranging from bio-sensing to optical communications. In bio-sensing, the high sensitivity of SPR to changes in the dielectric constant at the metal-dielectric interface is used to detect specific molecular bindings. We have studied the effect of adding ferromagnetic materials to Au films and we have found a remarkable enhancement of the magneto-optical Kerr effect in Au-Co-Au trilayers when SPR is excited¹. This large enhancement is ascribed to the increase of the electromagnetic field within the Co film due to the excitation of SPR, and has been modeled for ultrathin Co films². At resonance the electromagnetic field within the Au-Co-Au trilayer decays exponentially with the distance from the Au-air interface where the SPPs are propagating. In order to probe the influence of the electromagnetic field within the Co film on its magneto-optical response, Au-Co-Au trilayers with the Co film positioned at different distances from the Au-air interface, while keeping the thickness of all the layers constant were prepared using sputtering deposition in ultra-high vacuum conditions. Our latest results will be presented and differences with proposed model will be discussed. 1. V. I. Safarov et al., Phys. Rev. Lett. **73**, 3584. 2. C. Hermann *et al.*, Phys. Rev. B **64**, 235422.

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