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Enhanced Surface Plasmon Resonance. WEIQIANG MU, Northwestern University, JOON JANG, Northwestern Unviersity, MAXIM SUKHAREV, Arizona State University, DONALD BUCHHOLZ, ROBERT CHANG, JOHN KETTERSON, Northwestern University, KETTERSON TEAM, CHANG TEAM, SUKHAREV TEAM — We have studied the surface plasmon resonances in thin silver films sandwiched between silica. This is the so-called Sarid geometry which supports a (short-range) symmetric and a (long-range) anti symmetric mode. The coupling is achieved diffractively via an approximately sinusoidal surface etched in the underlying silica prior to deposition of a 20nm Ag film and a 400nm silica capping layer; the modulation amplitudes were 10, 30 and 50nm. FDTD simulations of the transmission (T) and reflection (R) coefficients show that for perpendicular incidence strong coupling occurs to the two plasmon modes along with a much weaker electromagnetic Woods anomaly. We will present data on both T and R showing evidence of coupling to the antisymmetric and symmetric Sarid modes as well as observations of waveguiding effects in the silica capping layer. Data will be compared with FDTD calculations for corresponding film parameters.

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