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Surface Plasmon Assisted Electro-Optical Switching of Molecular Thin Films in Metal-Insulator-Metal Devices RAGIP PALA, KEN SHIMIZU, NICHOLAS MELOSH, MARK BRONGERSMA, Stanford University — Molecular electro-optical switches are one of the major milestones in the development of optoelectronic memory elements as well as the long-standing goal of highly integrated photonic circuits. We intend to exploit the unique optical properties of photochromic compounds such as spiropyrans to realize these structures. We have constructed a set-up with which the wavelength dependent refractive index and absorption of a wide variety of molecules in a polymer film can be determined. Substantial changes in the refractive index and absorption have been observed for photochromic molecules sandwiched between two metal layers under the influence of an externally applied electric field. These changes can be exploited in optical and plasmonic switches. Preliminary results of such devices will be presented.

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