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Surface Plasmon Based Spectrometer[1] ANDREW WIG, Benedictine University, ALI PASSIAN[2], PHILIP BOUDREAUX, TOM FERRELL, University of Tennessee — A spectrometer that uses surface plasmon excitation in thin metal films to separate light into its component wavelengths is described. The use of surface plasmons as a dispersive medium sets this spectrometer apart from prism, grating, and interference based variants and allows for the miniaturization of this device. Theoretical and experimental results are presented for two different operation models. In the first case surface plasmon tunneling in the near field is used to provide transmission spectra of different broad band-pass, glass filters across the visible wavelength range with high stray-light rejection at low resolution as well as absorption spectra of chlorophyll extracted from a spinach leaf. The second model looks at the far field components of surface plasmon scattering.

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