Wire grid polarizers for the DUV und VUV spectral range

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Wire grid polarizers (WGPs) are large aspect ratio zero order gratings providing an anisotropic transmittance depending on the polarization direction of incident light. Their large angle of acceptance and their large free aperture while being simultaneously very compact render them highly attractive for application in spectroscopy, ellipsometry, lithography as well as for industrial vision. Metal based WGPs, e.g. made of aluminum, are well established in the visible and infrared spectral region. However, their performance deteriorates towards shorter wavelengths in the UV. For the extension of the application range of WGPs towards wavelengths in the VUV (120 nm -200 nm) spectral region material requirements and structural parameters must be met. In this talk we present theoretical and experimental results on the application of dielectric materials with direct band transitions and further illustrate how the optical performance of WGPs is affected by line edge roughness and asymmetries induced by the double patterning fabrication process..