



IR color separation in transmission through gratings on (110) silicon: FTIR experiment versus theory

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The phenomenon of filtering in zero-diffraction order is studied for transmission through 1D-periodic structures on a silicon wafer. Our study combines FTIR spectrometry in the range from 2.5 to 25 microns, and a rigorous full-vector simulation. The phenomenon exhibits itself as 'bright' and 'dark' bands in the spectra of normal transmission through grating samples, which replace each other quasi-periodically with respect to wave number, at wavelengths smaller than the grating period. The transmission modulation ratio is extremely high for two-side polished samples. Good agreement between the rigorous theory and experiment both in the range of the transmission oscillations and in the region of enhanced absorption is obtained

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