ANGULAR AND POLARIZATION DEPENDENCES OF LIGHT TRANSMISSION BY NARROWBAND OPTICAL FILTERS FROM REFRACTORY OXIDES

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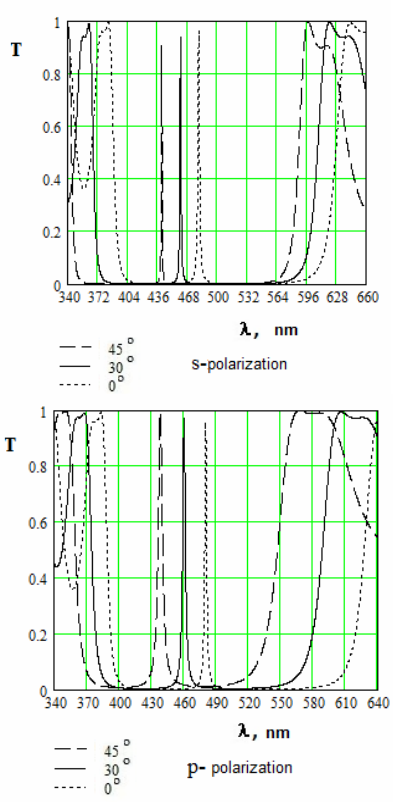
The dependences of transmission by narrowband multilayer filters on incidence angle values for s- and p-polarization of parallel light beams were investigated by developed program on Delphi 7 language. The considered filter structure S-HL...HLHHLH...HL→ S-$(HL)^4 2H(LH)^4$ posses 17 layers with altering of H and L layers with high (n_H) and low (n_L) refractive indices and optical thickness equal to quarter of functional wavelength λ_0 for the normal beam incidence deposited on transparent substrate S with refractive index (n_S).



The obtained transmission spectra are shown on figures. It was establish that with the increasing of incidence angle of parallel light beams on multilayer interference system the:

maximum T_{max} values of transmittance for s-polarized light beam decrease, while for the p-polarized one - increase, remaining always higher;

position of the maxima transmission λ_{max} always shifted in the short-wave region, being higher for s- polarized light;

half-width $\delta\lambda_{0,5}$ and $\delta\lambda_{0,1}$ of bands transmission for s- polarized light decreases, while for the p- polarized one are growing, remaining always higher;

bandwidth of the blocked spectral range within that the values of transmission below 0,1 T_{max} in a short wave $\Delta\lambda_S$ increases for the s-polarized light beams while decrease for p-polarized one. The values of blocked bandwidth $\Delta\lambda_L$ are reduced in long wave for both types of light polarization.

The limit values of spatial divergence angles for filtered beam's always determined only by total internal light reflection on the boundary between high and low refractive index layers or its with substrate.

The obtained dependences of interference filters parameters are identical for different types of all used transparent refractory oxides as for substrates as for interference system's high and low refractive layers.