

Tunable multilayer narrowband filter containing an ultrathin metallic film
and a lithium niobate defect

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Abstract

By using lithium niobate (LiNbO₃) as defect layer, a tunable multilayer narrowband reflection- and -transmission filter containing an ultrathin metallic film is proposed. Due to the voltage dependence of the refractive index for LiNbO₃, tunable optical filtering properties has been theoretically investigated based on the calculated wavelength dependent reflectance and transmittance. The dependence of peak wavelength on the applied voltage and the angle of incidence are numerically illustrated. The results reveal that in addition to working as a tunable filter, it can also be expected to act as a refractometric optical sensor.

Keyword : Metal/dielectric films. Narrowband filter. Electro-Optical tuning.