Eigenmodes of a Grating-Slab Waveguide: An Approach Based on the Analytic Theory

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We apply a powerful analytic theory of mode coupling in optical gratings that we proposed recently in [1], to reveal the structure and properties of the eigenmodes guided by an optical-grating layer sandwiched between cover and substrate uniform dielectric media. The results of such an analytic, as opposed to purely numeric, the approach could greatly benefit finding and designing the grating and photonic-crystal waveguide structures and metamaterials targeting eigenmodes with specifically desirable properties featuring, for instance, quasi-bound states, high-Q modes, tunable resonances, leaky stop bands, band flips, mode hybridization, *etc.*

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References

[1] V V Kocharovsky, C B Reynolds and Vl V Kocharovsky, Phys. Rev. A **100**, 053854 (2019)