# Abstract

**Homogenization Study of Resonances in Photonic Structures**

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Using the ideas of homogenization theory we study the leakage rates or scattering resonances associated with certain classes of optical waveguides with transverse microstructure. We derive and prove the validity of an effective (averaged) potential model. We further show how homogenization theory yields higher order corrections to the resonances and fields due to microstructure. Finally, we implement our theory numerically for various microstructure waveguides.

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