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**Sturm-Liouville Equation: The Bridge between Eigenvalue and Green's Function Problems**

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**Abstract:** This article is intended as an educational aid and discusses guided wave propagation problems that are modeled via the Sturm-Liouville equation in electromagnetics. The bridge between source-free (eigenvalue) and source-driven (Green's function) problems that are represented by the same Sturm-Liouville equation is emphasized. The presentation focuses on representation of an arbitrary source from the features (eigenfunctions) of the problem geometry and extraction of the eigenvalues of a problem from propagation characteristics (Green's function) on a canonical problem; a homogeneously filled parallel plate waveguide with non-penetrable boundaries

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