Finite-difference analysis of structures consisting of roundly and rectangularly shaped domains

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Abstract:

A new method is presented that allows the analysis of a combination of both circularly and rectangularly shaped subdomains in the same structure. The method is based on the use of polygonal grids in connection with the finite-difference method in the frequency domain. The convergence behaviour of this new efficient algorithm is analyzed and compared to conventional stair-case approximations for a circular waveguide. Finally, the dispersion characteristic of a square waveguide with a circular dielectric rod is presented.