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# A Set of New SDA Basis Functions for the analysis of Superconducting Microstrip

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**Abstract:**

Superconducting passive microwave devices such as transmission lines, antennas, Filters, and phase shifters have shown significant superiority over corresponding devices fabricated with normal conductors such as gold, silver, or copper due to the advantages of superconductors. Advantages of using high *Tc* superconducting materials at high frequencies include [1]: 1) very small losses, which means reduction of attenuation and noise level; 2) very small dispersion up to frequencies of several tens of GHz; 3) smaller devises due to the lower losses, which leads to larger integration density; and 4) the propagation time can be greatly reduced because of the smaller size and the shorter interconnects.

the method approved and used is the spectral method, this method is employed according to a choice of basic functions, which satisfies the conditions of singularity on the edge of the conductor, and this choice is a key factor in the process of convergence, In this technique the superconducting strip is treated as an impedance sheet which introduces new boundary conditions at the surface of the strip.

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[1]. El-Ghazaly, S. M., R. B. Hammond, and T. Itoh, \Analysis of superconducting microwave structures: application to microstrip lines," *IEEE Trans. Microwave Theory Tech.*, Vol. 40, No. 3, 499{508, 1992.