

# Characteristics of a high $T_c$ superconducting rectangular microstrip patch on uniaxially anisotropic substrate

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**Abstract:** Resonant characteristics of a high  $T_c$  superconducting rectangular microstrip patch printed on uniaxially anisotropic substrate are investigated using a full-wave spectral analysis in conjunction with the complex resistive boundary condition. The uniaxial medium shows anisotropy of an electric type as well as anisotropy of a magnetic type. Both permittivity and permeability tensors of the substrate are included in the formulation of the dyadic Green's function of the problem. The accuracy of the analysis is tested by comparing the computed results with previously published data for several anisotropic substrate materials. Numerical data of the resonant frequency and bandwidth as a function of electric anisotropy ratio are presented. Variations of the resonant frequency and bandwidth with the magnetic anisotropy ratio are also given. Finally, results showing the influence of the temperature on the resonant frequency and quality factor of the high  $T_c$  superconducting rectangular microstrip patch on a uniaxial substrate are also given.

**Keywords :** superconducting microstrip patch, Anisotropic substrate, Permittivity and permeability tensors