

## Study of the Electromagnetic Resonances of a Cavity with an Aperture Using Numerical Method and Equivalent Circuit Method

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**Abstract :** The shielding ability of a shielding cavity is affected greatly by its resonances, which include resonance modes and frequencies. The equivalent circuit method and numerical method of transmission line matrix (TLM) are used to analyze the effect of aperture-cavity coupling on electromagnetic resonances of a cavity with an aperture in this paper. Both theoretical and numerical results show that the resonance modes of a shielding cavity with an aperture can be considered as the combination of cavity and aperture inherent resonance modes with resonance frequencies shifting, and the reason of this shift is aperture-cavity coupling. Because aperture sizes are important parameters to aperture-cavity coupling, variation rules of electromagnetic resonances of a shielding cavity with its aperture sizes are given, which will be useful for the design of shielding cavities.

**Keywords :** aperture-cavity coupling, equivalent circuit method, resonances, shielding equipment

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