

# Abstracts

## A New Boundary Integral Approach to the Determination of the Resonant Modes of Arbitrarily Shaped Cavities

---

*P. Arcioni, M. Bressan and L. Perregrini. "A New Boundary Integral Approach to the Determination of the Resonant Modes of Arbitrarily Shaped Cavities." 1995 Transactions on Microwave Theory and Techniques 43.8 (Aug. 1995 [T-MTT]): 1848-1856.*

We present an efficient algorithm to determine the resonant frequencies and the normalized modal fields of arbitrarily shaped cavity resonators filled with a lossless, isotropic, and homogeneous medium. The algorithm is based on the boundary integral method (BIM). The unknown current flowing on the cavity wall is considered inside a spherical resonator, rather than in free-space, as it is usual in the standard BIM. The electric field is expressed using the Green's function of the spherical resonator, approximated by a real rational function of the frequency. Consequently, the discretized problem can be cast into the form of a real matrix linear eigenvalue problem, whose eigenvalues and eigenvectors yield the resonant frequencies and the associated modal currents. Since the algorithm does not require any frequency-by-frequency recalculation of the system matrices, computing time is much shorter than in the standard BIM, especially when many resonances must be found.

 [Return to main document.](#)