Low-Frequency Characteristic Modes for Aperture Coupling Problems

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Abstract —**In this paper, a recently suggested general procedure which leads to an eigenvalue equation for aperture problems is specialized to the range of frequencies for which the maximum linear dimension of the aperture l is much smaller than the wavelengths, known as the Rayleigh region. As kl asymptotically approaches zero, we arrive at a set of two eigenvalue equations which, aided by the edge condition, constitutes an alternative set of equations for a derivation of the quasi-static distributions characterizing the aperture.**

ference. A model used in recent years is that of two regions separated by an infinitely thin, perfectly conducting wall in which an aperture is cut. The method of solution is briefly as follows. The equivalence principle is used to divide the original problem into two parts; this is done by replacing the aperture by a perfect conductor and providing for the tangential electric field originally present in the