Single-Post Inductive Obstacle in Rectangular Waveguide

YEHUDA LEVIATAN, MEMBER, IEEE, PING G. LI, ARLON T. ADAMS, SENIOR MEMBER, IEEE, AND JOSE PERINI, SENIOR MEMBER, IEEE

Abstract—A rapidly converging moment solution for electromagnetic scattering by a single inductive post in a rectangular waveguide is obtained. The numerical results show good agreement with Marcuvitz's data as far as this data goes. Furthermore, Marcuvitz's curves are extended to cover data for large posts. This new data should allow one to design a simply constructed new type of narrow bandpass filter, namely, a filter consisting of large single posts. The successful use of this straightforward moment solution in solving the single-post problem suggests that this technique should prove useful in solving a variety of microwave discontinuities such as those involving thin or thick irises and posts of arbitrary shape.

single-post problem and extends Marcuvitz's curves to cover data for large posts. This new data should allow one to design a simply constructed new type of narrow band-pass filter, namely, a filter consisting of large single posts.

In treating the single-post problem, we use a multifilament representation of the current. The field due to each filament is then expanded in terms of waveguide modes. This leads to a slowly converging series which is not convenient for computation. Fortunately, this severe