Analytic Continuation Considerations when Using Generalized Formulations for Scattering Problems

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Abstract—**Generalized formulations for scattering problems using fictitious currents flowing over mathematical surfaces distanced from the physical boundary surface have been found to be a feasible and often preferred alternative to standard surface formulations. To solve the generalized formulations, one can in general apply a method of moments numerical solution using as expansion functions sets of sources whose fields are analytically derivable and for testing a simple point-matching procedure. The convergence rate and accuracy of the numerical algorithm are liable to depend on how the distribution of each set of sources and the location of the singularities of the actual field this set is simulating are spatially related. This paper touches upon these convergence and accuracy aspects by means of a simple scattering problem.**

solutions do not exist, then the currents at best approximate the required boundary conditions in some sense and consequently produce only approximate fields in the corresponding regions.

To solve the proposed generalized formulations, one can in general apply a method of moments numerical solution [5]. Usually, spatially impulsive sources whose fields are analytically derivable and easy to calculate are used as expansion functions for the unknown currents [1], [2]. In some cases, however, other sources whose fields are known analytically should be preferred [3]. The boundary conditions are satis-