

Fast integral-equation approaches for the analysis of antenna arrays and metasurfaces

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Maxwell's equations can be solved using different categories of methods. Among them are integral-equation approaches, which are appealing for piecewise homogeneous media, which are plethora in man-made structures, such as phased arrays on printed-circuit boards. In those configurations, the unknown fields are limited to interfaces or even just to conducting parts. This is made possible through the use of Green's functions, which analytically provide fields radiated by point sources in canonical geometries. The presentation will first remind the basics of integral-equations methods, and then delve into recent advances in the fields of singularity extractions, fields in periodic structures and techniques dealing with large structures. Application examples will be provided in the areas of large arrays and metasurfaces.