Reduction of truncation errors in planar, cylindrical, and partial spherical near-field antenna measurements - DTU Orbit (31/12/2018)

Reduction of truncation errors in planar, cylindrical, and partial spherical near-field antenna measurements

A method to reduce truncation errors in near-field antenna measurements is presented. The method is based on the Gerchberg-Papoulis iterative algorithm used to extrapolate band-limited functions and it is able to extend the valid region of the calculated far-field pattern up to the whole forward hemisphere. The extension of the valid region is achieved by the iterative application of a transformation between two different domains. After each transformation, a filtering process that is based on known information at each domain is applied. The first domain is the spectral domain in which the plane wave spectrum (PWS) is reliable only within a known region. The second domain is the field distribution over the antenna under test (AUT) plane in which the desired field is assumed to be concentrated on the antenna aperture. The method can be applied to any scanning geometry, but in this paper, only the planar, cylindrical, and partial spherical near-field measurements are considered. Several simulation and measurement examples are presented to verify the effectiveness of the method.

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