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## Floquet Wave Diffraction Theory for Tapered Planar Strip Array Green's Function

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**Abstract:** This paper deals with the derivation and physical interpretation of a uniform high frequency representation of the Green's function for a planar phased array of dipoles. The asymptotic representation is based on Floquet wave edge diffraction theory herein extended to accommodate slowly varying tapered amplitude illumination with possible inclusion of dipole amplitudes that tend to zero at the edge. The phased array is assumed to be infinite with uniform amplitude excitation in the z-direction but finite and amplitude-tapered in the x-direction. This geometry permits study of diffraction phenomena occurring at the tapered edge of a rectangular array when the observation point is far from its vertexes, and extends earlier results valid for equiamplitude excitation with inclusion of subdominant slope diffraction terms. Numerical calculations are included to demonstrate the accuracy of the asymptotic algorithm. The results obtained here have already found applications to (i) a Floquet-ray algorithm which is being interfaced with available codes based on the Geometrical Theroy of Diffraction (GTD), and (ii) the construction of a method of moments code which uses global basis functions shaped like diffracted currents arising from the edges and vertexes of the array; both projects are sponsored by the European Space Agency (ESA).

**Key Words:** Floquet wave diffraction theory, Fluquet-ray algorithm, array Green's function, truncated large phased arrays, tapered illumination

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