Abstract

In this paper, an aperture distribution for the synthesis of a specified radiation pattern is designed and it is applied to a linear array of discrete sources. The cosecant pattern is achieved by an optical antenna system with Luneburg lens. These patterns are produced using Fourier transform method. Computed cosecant patterns for different beamwidths are presented. These patterns are used in ground-mapping airborne radars and ground-based search radars applications.

References

- Tse-Tong Chia and Wai-Yean Lim, "Design of low profile cylindrical Luneburg lens..."
Optimized Cosecant Patterns from Arrays of Discrete Sources

- R. K. Luneburg, Mathematical Theory of optics. Berkeley and Los Angeles,
- Ajoy Chakraborty et al. ; Scanning of Sector and Cosecant Beams Generated by a
Circular Aperture; IEEE Transactions on Antennas and Propagation, Vol. AP-32, No. 9,
September 1984.
- G. V. Borgiotti; Degrees of freedom of an antenna scanned in a limited
- E. C. Dufort; Optimum Optical limited Scan Antenna; IEEE Trans.
- R. J. Mailloux and P. Blacksmith; Array and reflector techniques for airport
- W. Rotman and R. F. Turner; Wide angle microwave lens for line source
- B. Sadasiva Rao and G. S. N. Raju; shaped beams from thick arrays;
577-592, ISSN - 2011.
- Kang Wook Kim; Characterizations of Spherical Luneburg Lens Antennas with
Air-gaps and Dielectric Losses; Journal of the Korea Electromagnetic Engineering
- G. R. L. V. N. Srinivas Raju et al.; Generation of shaped beam radiation patterns
from a line source using Iterative sampling method; IJEST, Vol. 5, NO. 08 August 2013.

- J. A. Rodriguez et al.; Extension of the Orchard-Elliott Synthesis Method to
Pure-Real Non Symmetrical Shaped Patterns; IEEE Transactions on Antennas and
- Michael J. Buckley et al.; Synthesis of Shaped Beam Antenna Patterns Using
Implicitly Constrained Current Elements; IEEE Transactions on Antennas and

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