Highly Subwavelength, Superdirective Cylindrical Nanoantenna

A superdirective cylindrical nanoantenna is demonstrated with a multilayered cylindrical metamaterial-inspired structure. Targeting specific scattering coefficients for the dipole and higher-order modes, the ideal limit of needle radiation is demonstrated. A five-layer system is optimized to demonstrate its approach to the theoretical directivity bound. While the resulting structure is scalable to any frequency regime, its highly subwavelength overall size ($\lambda_0/10$) takes advantage of combinations of positive and negative permittivity materials in the optical regime.

General information
Publication status: Published
Organisations: Department of Electrical Engineering, Electromagnetic Systems, University of Technology Sydney
Contributors: Arslanagic, S., Ziolkowski, R. W.
Number of pages: 1
Pages: 237401
Publication date: 2018
Peer-reviewed: Yes

Publication information
Journal: Physical Review Letters
Volume: 120
Issue number: 23
ISSN (Print): 0031-9007
Ratings:
BFI (2018): BFI-level 2
Scopus rating (2018): CiteScore 8.64 SJR 3.571 SNIP 2.532
Web of Science (2018): Indexed yes
Original language: English
Electronic versions:
PhysRevLett.120.237401.pdf
DOIs:
10.1103/PhysRevLett.120.237401

Bibliographical note
Source: FindIt
Source ID: 2435345420
Research output: Contribution to journal › Journal article – Annual report year: 2018 › Research › peer-review