Abstracts

Dielectric Hemisphere-Loaded Scalar Horn as a Gaussian-Beam Launcher for Microwave Exposure Studies

P.S. Neelakantaswamy and F.C. Hong. "Dielectric Hemisphere-Loaded Scalar Horn as a Gaussian-Beam Launcher for Microwave Exposure Studies." 1979 Transactions on Microwave Theory and Techniques 27.9 (Sep. 1979 [T-MTT]): 797-799.

A new type of Gaussian-beam luncher for producing a focused-microwave exposure field in biological experiments for selective partial-body irradiation is studied. The proposed launcher consists of a scalar horn (corrugated cylindrical open-ended waveguide) excited with a balanced hybrid (HE/sub 11/) mode and the aperture of the horn is loaded with a dielectric hemisphere. This Iauncher is similar to the structure described by one of the authors elsewhere, except that a dielectric hemisphere instead of a full sphere is used, with the result that the spherical aberration is considerably reduced, as well as that the weight and the size are, to a certain extent, reduced. It is shown that the present structure also produces in the image space of hemispherical lens, a near-circular Gaussian beam with a high-focusing factor. Design details, theoretical calculations, and experimental results conceming a practical X-band launcher are presented.

❑ Return to main document.