Abstracts

Refraction at a Curved Dielectric Interface: Geometrical Optics Solution

The transmission of a spherical or plane wave through an arbitrarily curved dielectric interface is solved by the geometrical optics theory. The transmitted field is proportional to the product of the conventional Fresnel's transmission coefficient and a divergence factor (DF), which describes the cross-sectional variation (convergence or divergence) of a ray pencil as the latter propagates in the transmitted region. The factor DF depends on the incident wavefront, the curvatures of the interface, and the relative indices of the two media. We give explicit matrix formulas for calculating DF, illustrate its physical significance via examples.

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