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**RAY-OPTICAL CALCULATION OF SCATTERING BY  
DISCONTINUITIES IN WAVEGUIDES--RECENT  
DEVELOPMENTS**

**L. B. Felsen**

**Electrophysics Department, Polytechnic Institute of Brooklyn,  
Farmingdale, New York, USA**

The previously developed ray-optical theory for scattering by discontinuities in a homogeneously filled waveguide has been extended to inhomogeneously filled, closed or leaky guides and ducts, and to guiding structures comprised of multiwave media; included among the latter are, for example, warm (compressible) plasmas supporting electromagnetic and acoustic waves, and elastic solids supporting compressional and shear waves. The theory is summarized and applied to various examples, included among which is VLF propagation and scattering in the earth-ionosphere waveguide modeled as a parallel plane region filled with a linearly varying refractive index medium. Typical results are presented and discussed, and attention is given also to recently proposed refinements of the method.