Abstracts

Experimental study of the surface waves on a dielectric cylinder via terahertz impulse radar ranging

R.W. McGowan, R.A. Cheville and D.R. Grischkowsky. "Experimental study of the surface waves on a dielectric cylinder via terahertz impulse radar ranging." 2000 Transactions on Microwave Theory and Techniques 48.3 (Mar. 2000 [T-MTT]): 417-422.

Employing an ultrafast optoelectronic terahertz impulse radar range with subpicosecond resolution, we have characterized the electric-field time-domain response from an impulsively excited dielectric cylinder. The bandwidth of the measurement extends from 200 GHz to 1.4 THz and late time response is observed at times exceeding that to traverse 40 target radii at c. A physical optics (PO) model is employed to identify the different mechanisms of scattering for the temporally isolated signals. Through analysis of the first and second surface-wave signals it is determined that the surface wave has a propagation velocity of 0.91c and an effective index of refraction of n=1.10+0.073i. The first measurement of the coupling efficiency of this surface wave through the cylinder via an interior chord at the critical angle is performed along with the determination of the /spl pi//2 phase shift associated with the single axis caustic of this interior chord in the PO model.

❑ Return to main document.