Abstracts

Guided Waves in Moving Dispersive Media Part II: Relativistic Velocities

H. Berger and J.W.E. Griemsmann. "Guided Waves in Moving Dispersive Media Part II: Relativistic Velocities." 1968 Transactions on Microwave Theory and Techniques 16.1 (Jan. 1968 [T-MTT]): 16-20.

The detailed modal field structure has been determined for electromagnetic waves propagating in a uniform cylindrical lossless waveguide of arbitrary cross section filled with a moving medium. The medium is assumed to be homogeneous, isotropic, and nondissipative, but may be dispersive. It moves uniformly, with a constant speed v, parllel to the axis of the waveguide. The solutions obtained are exact closed-form functions of the space variables, time, modal wave frequency, and propagation factor, and they hold for any value of the magnitude of v, from zero up to the speed of light in vacuum. The electromagnetic power flow in the waveguide is investigated and shown to display characteristics that differ considerably from those associated with the stationary medium case. The general theory is applied to several types of moving media, including nondispersive media and the idealized low-temperature plasma.

❑ Return to main document.