Abstracts

Scattering of Electromagnetic Waves by a Cylinder Moving Along its Axis

The scattering of a time-harmonic, linearly polarized plane electromagnetic wave by a cylinder uniformly moving along its axis is discussed. The formalism is relativistically exact, and explicit forms are provided for first-order velocity effects. Consideration is given to both a cylinder moving in free space, using the procedure suggested by Einstein, and two refractive media; it is veritied that the first case is a special case of the second one. Thin scatterers are considered and it is shown that no first-order velocity effects are present. For a moving medium, having in its rest frame the same constitutive parameters as the surrounding medium, it is shown that the velocity-independent part vanishes, but scattered fields of the first order in the velocity are still present. Moreover, these waves appear with the opposite polarization (compared to the incident wave).

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