Abstracts

Electromagnetic Wave Transmission in a Well Logging Cable--Theory (Short Papers)

J.R. Wait. "Electromagnetic Wave Transmission in a Well Logging Cable--Theory (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1518-1521.

A well logging cable is idealized as a uniform cylindrical structure consisting of N axial dielectric-coated thin wires in a lossy medium, all encased by a metallic sheath. A general modal equation is developed which is specialized to low frequencies where quasi-static conditions prevail. It is pointed out that the line parameters are spatially dispersive in addition to being frequency dependent. The formulation differs from most multiconductor transmission theories because of the presence of the lossy filler material, which actually allows for a simplification of the working mode equation, which is an N-order polynomial.

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