

# Modeling the Dielectric Mediums Impact on Coaxial Transmission Line Performance

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## **Abstract:**

*In this research, mathematical modeling for the coaxial cable has been used to analyze transmission line performance under three different dielectric mediums which are propagation medium in the coaxial cable and to illustrate their role in the amount of Characteristic Impedance (Char Imp) of the transmission line. Polyimide, polyethylene and Teflon dielectric materials have been examined to extract the values of the electrical model elements, hence, the total reluctance and attenuation of the line. Also, this analysis is related to dielectric mediums with respect to dielectric heat losses and its influences on coaxial cable inner and outer conductors. Therefore, the mathematical model assembled by MATLAB is used to examine coaxial cables performance according to the above effects of (dielectrics) insulators performance. Extracted results have demonstrated the losses and attenuation in the propagation of electromagnetic waves.*