Abstracts

The Capacitances and Surface Charge Distributions of a Shielded Unbalanced Pair (Short Papers)

J.D. Nordgard. "The Capacitances and Surface Charge Distributions of a Shielded Unbalanced Pair (Short Papers)." 1977 Transactions on Microwave Theory and Techniques 25.2 (Feb. 1977 [T-MTT]): 137-140.

The capacitance matrix of an unbalanced shielded pair cable is determined theoretically. The wires of the cable are asymmetrically located about the axis of the shield and have different radii; however, the axes of the wires are restricted to lie on a line passing through the axis of the shield. The elements of the capacitance matrix are determined as particular elements of the inverse of a truncated intinite matrix, which relates the Fourier coefficients of the surface charge densities on the inner conductors and the shield to the applied voltage excitations on the cable conductors. The capacitances and surface charge distributions are evaluated numerically for a shielded pair cable, which, due to inaccuracies in the cable manufacturing processes, has one wire with a smaller or larger radius than the other wire of the pair and/or has one wire closer to or farther from the axis of the shield than the other wire of the pair.

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