

## Analysis of Exponential Nonuniform Transmission Line Parameters

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**Abstract :** In this paper the Analysis of voltage waves that propagate along a lossless exponential nonuniform line is presented. For this analysis the parameters of this line are assumed to be varying function of the distance  $x$  along the line from the source end. The approach is based on the tow-port networks cascading presentation to derive the ABCD parameters of transmission using Picard-Carson Method which is a powerful method in getting a power series solution for distributed network because it is easy to calculate poles and zeros and solves differential equations such as telegrapher equations by an iterative sequence. So the impedance, admittance voltage and current along the line are expanded as a Taylor series in  $x/l$  where  $l$  is the total length of the line to obtain at the end, the main transmission line parameters such as voltage response and transmission and reflexion coefficients represented by scattering parameters in frequency domain.

**Keywords :** ABCD parameters, characteristic impedance exponential nonuniform transmission line, Picard-Carson's method, S parameters, Taylor's series

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