

# **Analysis of Diffraction of Dominant Mode in an Acoustic Impedance Loaded Trifurcated Duct**

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The paper presents the analytical description of diffraction phenomena of sound at the opening of a two dimensional semi-infinite acoustically soft duct. This soft duct is symmetrically located inside an infinite duct with normal impedance boundary conditions in the case where the surface acoustic impedances of the upper and lower infinite plates are different from each other. A matrix Wiener-Hopf equation associated with a new canonical scattering problem is solved explicitly. A new kernel function arose for the problem and has been factorized. The graphical results are also presented which show how effectively the unwanted noise can be reduced by proper selection of different parameters.

*Key words:* Sound Diffraction; Lined Duct; Integral Transform; Wiener-Hopf Technique; Expansion Coefficients; Pole Removal Technique.