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Application of the Mode Matching Technique to Fluid - Solid Layered Acoustic Problems

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An application of Mode Matching technique for analyzing interactions between range dependent fluid-solid layers in two dimensional cylindrical coordinates is presented by using Normal Mode method. The transmission loss for fluid-solid medium with semi-infinite bottom layer is calculated for range-dependent bottom profiles. The bottom solid half space is divided independent vertical regions due to different bottom parameters for simulation of the real acoustic environment. The transition between the independent vertical regions is ensured by using Mode Matching technique with Normal Mode method. The attenuation of acoustic wave modes in a range dependent two layered fluid-solid medium due to absorption of the lower semi-infinite solid layer is calculated. In order to validate the obtained results in the sense of Transmission Losses, Parabolic Equation program (RAM) is used for different transition cases. The good agreement is found between the results which can be used for realistic Sonar simulators.