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Recent Progress on the Theoretical Modeling of Underwater
Acoustics Induced By Sonic Booms

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This paper, review and status in nature, consists of three parts: (1) The salient nature and results of the published papers from an ocean sonic boom (OSB) project will be reviewed including theoretical and experimental studies of the wavy surface effect on the underwater acoustics, a three dimensional theory of underwater acoustics and the underwater acoustics induced by a sonic boom traveling at hyper-velocity speeds. (2) New unpublished results will be reported including studies of sonic boom underwater overpressures affected by ocean finite depth and ocean stratification (variable sound speed). These studies are possible due to the derivation of a semi-similar transformation for the underwater acoustics governing equations and the application of high performance computers. (3) The preliminary results of the work-in-progress will also be discussed including three-dimensional extensions of former professor H. K. Cheng's two-dimensional wavy surface theory and laboratory verification.