

Abstract Submitted
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A Cloak of Invisibility Against Ocean Waves REZA ALAM, University of California, Berkeley — In this talk we show that floating objects in stratified fluids can be cloaked against broadband incident waves by properly architecting the bottom corrugations. The density of water in an ocean or a sea is typically not constant due to, mainly, variations of temperature and salinity. Stratified waters, besides regular surface waves, admit the so-called internal waves, which are gravity waves that propagate within the body of the water. The concept behind the presented scheme is based on nonlinear resonance of surface and interfacial waves with the bottom topography and is obtained due to the dispersive nature of gravity waves. Perfect cloaking against monochromatic waves can theoretically be achieved and was further investigated via a direct high-order spectral scheme. The presented cloak is the alignment of bottom corrugations only, and therefore is surface non-invasive. Cloaking in seas by bottom modifications may play a role in protecting near shore or offshore structures (buoys) and in creating shelter for fishermen during storms. In reverse it can result in disappearance and appearance of surface waves in areas where sandbars (or any other appreciable bottom variations) exist.

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