

Abstract Submitted
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Cloaking water waves via an elastic buoyant carpet AHMAD ZAREEI, MOHAMMAD-REZA ALAM, University of California, Berkeley — We propose a cylindrical cloak for gravity waves passing through an elastic floating carpet. This is achieved by a spatially variable flexural rigidity while mass density and water depth are kept constant. The cloak is deduced from transformation media scheme and coordinate transformation of the coupled governing equation for the buoyant carpet and the fluid underneath. The major challenge is that the governing equation is not form-invariant; while transformation media scheme requires a form-invariant governing equation. We approximate the governing equation with a form-invariant equation which is exact for a homogeneous and isotropic floating carpet. We compare the results with the solution of the exact governing equation and show the scattering waves of the cylinder are significantly suppressed, hence cloaking is achieved.

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