

Abstract Submitted
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Dispersion free control of hydroelastic waves down to sub-wavelength scale LUCIE DOMINO, MARC FERMIGIER, EMMANUEL FORT, ANTONIN EDDI, ESPCI — Hydroelastic surface waves propagate at the surface of water covered by a thin elastic sheet and can be directly measured with accurate space and time resolution. We present an experimental approach using hydroelastic waves that allows us to control waves down to the sub-wavelength scale. We tune the wave dispersion relation by varying locally the properties of the elastic cover and we introduce a local index contrast. This index contrast is independent of the frequency leading to a dispersion-free Snell-Descartes law for hydroelastic waves. We then show experimental evidence of broadband focusing, reflection and refraction of the waves. We also investigate the limits of diffraction through the example of a macroscopic analog to optical nanojets, revealing that any sub-wavelength configuration gives access to new features for surface waves.

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