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Luneburg modified lens for surface water waves HELENE PICHARD, Laboratoire de Physique et Mécanique des Milieux Hétérogènes, PMMH/ESPCI, Paris, AGNES MAUREL, Institut Langevin LOA, ESPCI, Paris, PHILLIPE PETITJEANS, Laboratoire de Physique et Mécanique des Milieux Hétérogènes, PMMH/ESPCI, Paris, PAUL MARTIN, Department of Applied Mathematics and Statistics, Colorado School of Mines, USA, VINCENT PAGNEUX, Laboratoire d'Acoustique de l'Université du Maine, Le Mans — It is well known that when the waves pass across an elevated bathymetry, refraction often results in amplification of waves behind it. In this sense, focusing of liquid surface waves can be used to enhance the harvest efficiency of ocean power. An ocean wave focusing lens concentrates waves on a certain focal point by transforming straight crest lens of incident waves into circular ones just like an optical lens. These devices have attracted ocean engineers and are promising because they enable the effective utilization of wave energy, the remaining challenge being to increase the harvest efficiency of the lens. In this work, in order to improve well known focusing of surface liquid waves by lens, the propagation of liquid surface waves through a Luneburg modified lens is investigated. The traditional Luneburg lens is a rotationally symmetric lens with a spatially varying refractive-index profile that focuses an incident plane wave on the rim of the lens. The modified Luneburg lens allows to choose the position of the focal point, which can lie inside or outside the lens. This new degree of freedom leads to enhanced focusing and tunable focusing. The focusing of linear surface waves through this lens is investigated and is shown to be more efficient than classical profile lenses.

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