

Abstract Submitted
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Wave attenuation by flexible vegetation CLINT WONG, University of Oxford, PHILIPPE TRINH, University of Bath, JON CHAPMAN, University of Oxford — The study of fluid flows interacting with vegetative structures in coastal regions presents a significant challenge on account of its multi-scale nature. In this talk, we show how compact asymptotic reductions allow us to study surface waves over submerged vegetative regions. The vegetation is modeled as a collection of elastic cantilever beams in cross-flow and is coupled to fluid momentum equations. Our simplified framework provides some advantages to existing models. For example, for rigid plants over a horizontal bed, previous work on linear waves predicts a quadratic decay in wave amplitude. However, by accounting for plant flexibility, we predict a sub-quadratic decay that agrees more closely with experimental observations. Consideration of a varying depth further demonstrates competition between shoaling and vegetative dissipation.

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