

77th Annual Meeting of the Division of Fluid Dynamics
Sunday–Tuesday, November 24–26, 2024; Salt Lake City, Utah

Session X08: Surface Tension Effects: Capillary Phenomena

8:00 AM–10:23 AM, Tuesday, November 26, 2024

Room: Ballroom H

Chair: Sadaf Sobhani, Cornell University

Abstract: X08.00003 : Experimental Study of Wetting effect on Capillary-gravity Wave Scattering from a Barrier*

8:26 AM–8:39 AM

◀ *Abstract* ▶

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The wetting phenomenon at three-phase boundaries (solid, liquid, and gas) affects capillary-gravity wave scattering from barriers, but there is a lack of experimental data and comparison with simulations. The scattering is affected by surface tension and the contact lines at the three-phase boundary. When the solid surface conditions vary, the contact angle and the shape of the meniscus generated by the wetting effect change accordingly. It is possible to measure the influence of the wetting effect on the scattering by coating the barrier surface to be hydrophobic or hydrophilic. Our previous work focused on how the scattering is affected by the portion of the barrier immersed under the water surface with a pinned contact line. In this study, we will coat the barrier surface to experimentally measure how the wetting with different coatings affect the scattering. A comparison of the experimental measurements with numerical simulations of potential flow of the waves will be potentially included.

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