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POD analysis of Langmuir circulation interacting with a crossed pressure gradient driven flow GUILLAUME MARTINAT, CHESTER GROSCHE, Center for Coastal Physical Oceanography / Old Dominion University, ANDRES TEJADA-MARTINEZ, University of South Florida — The interaction between surface gravity wave and a wind driven shear current can lead to the generation of longitudinal counter-rotating pairs of vortices. This phenomenon is known as Langmuir Circulation and can extend to the full depth of the water column in coastal shallow waters. In cases of full depth Langmuir circulation, the cells are subjected to interactions with tidal currents of comparable magnitude as the current generated by wind shear and the intensity of the cells may be affected. The intent of this study is to apply proper orthogonal decomposition on results obtained through large eddy simulation, in order to evaluate the influence of a cross tidal current on the energy contained in Langmuir cells with a wave forcing varying in amplitude and wavelength. The stress Reynolds numbers considered will allow an equal stress for the pressure gradient driven flow and the wind driven flow and the total Reynolds number is set at 395.

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