



On the freakishness of following seas

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In recent years, freak waves have been one of the major focus areas in the ocean wave community. A particular interest has been devoted to distinguish the probability of freak waves for different sea states. Our work investigates the effect of longcrested swell waves on longcrested windsea waves. The analysis is based on laboratory experiments and numerical simulations with the higher order spectral method.

The statistical analysis is performed in two different ways and includes the comparisons of skewness and kurtosis along the tank as well as exceedance probability plots of the envelope and the crest height. First, the two wave systems are partitioned and analysed separately. Second, the full sea state is analysed.

We found that the statistics of the windsea waves are comparable irrespective if a swell is present or not. The analysis of the combined sea state changes the results, suggesting that the wave systems in mixed seas must be partitioned in order to estimate the severity of the sea states.