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Laboratory Experiments on wave-turbulence interactions

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Laboratory experiment was carried out in a wave tank to research the interaction between surface wave and pre-existing turbulence. The homogenous and uniform turbulence was produced by grid stirring and the mechanical wave was generated by wave maker. ADV was used to measure water velocity with sampling frequency of 128Hz. Three kinds of experiments were carried out: only mechanical wave with period of 1.0s, only homogenous and uniform turbulence, and homogenous and uniform turbulence superimposed by mechanical wave with period of 1.0s. Results show that surface wave can indeed modulate pre-existing turbulence and the modulation generally occurs in wave trough.