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PSI and turbulence during the interaction of the internal wave beam with upper ocean pycnocline BISHAKHDATTA GAYEN, Australian National University, SUTANU SARKAR, University of California San Diego — Three-dimensional numerical simulations are performed to investigate the interaction of a semidiurnal internal wave (IW) beam with the nonuniform stratification of an upper ocean pycnocline. During the initial stage of the interaction, higher harmonics originate after reflection of the IW beam at the caustic and are trapped in the pycnocline, while at later time the incoming beam undergoes a parametric subharmonic instability (PSI) inside the pycnocline, that exhibit exponential growth with a rate of 2/3 day^{-1}. During PSI small vertical waves form resulting in wave steepening and produce convective overturns. Convective instability initiates transition to turbulence while shear production maintains it. Turbulence is characterized by examining the temporal evolution of its production and dissipation.

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