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PSI of the oceanic internal tide JEROEN HAZEWINKEL, YUE-KIN TSANG, KRAIG B. WINTERS, WILLIAM R. YOUNG, University of California, San Diego, INTERNAL WAVES ACROSS THE PACIFIC COLLABORATION — The dynamics of a forced, low-mode oceanic internal tide propagating poleward on a beta plane are investigated numerically. We focus on the instability that transfers energy from the forced wave to waves at subharmonic frequency near the critical latitude where the subharmonic and local inertial frequencies match. Through parametric subharmonic instability (PSI), energy is transferred to motions that have a fine-scale modal structure, both in the horizontal and vertical directions. During the exponential growth phase, these motions do not provide a major sink of energy for the tide. A significant reduction in poleward energy flux is only observed once the amplitude of the near-inertial waves becomes comparable to tide itself and dynamics become fully non-linear. The observed decrease flux is approximately 15 percent, much less than was found in previous numerical studies but in reasonable agreement with recent estimates from observational data taken near the critical latitude in the Pacific.

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