Internal tide dynamics and energy dissipation in La Jolla Canyon

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Submarine canyons are energetic regions and are play a crucial role in energy dissipation in oceans. This study presents internal tides dynamics and associated energy budgets in La Jolla Canyon, south California, investigated with numerical simulations. Validations between model results and field observations show good agreements between them. The canyon can be separated into two regimes: (1) Generation regime, the mouth of the canyon, causing strong internal tide generation, and (2) Dissipation regime, inner part of the canyon, inducing energy dissipation of incoming internal tide energy. The intensity of internal tides and energy dissipation are higher on the south side of the canyon than those on the north side, which is supposed to be owing to earth’ s rotational effects. Generated internal tides at the mouth of the canyon also radiate toward offshore due to a super critical (reflective) condition. Reflected internal tides interact with incident internal tides resulting in standing wave structures off the canyon.

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