

# MASTER OF SCIENCE IN PHYSICAL OCEANOGRAPHY

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## INTERNAL TIDAL BORES IN THE MONTEREY CANYON

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A thirty-four day record of near-bottom temperature and horizontal velocity spanning the lower third of the water column from within Monterey Canyon was examined. The observed internal tide is highly non-linear with kinetic energy dispersed among numerous overtides near the bottom and more concentrated in the primary semi-diurnal constituent (M2) higher in the water column. The bottom currents and temperature vary in strength over the record period, taking on the characteristics of an internal bore at times with large up-canyon accelerations accompanied by rapid temperature drops. The bores are nearly phase locked to the sea level variations and arrive at the measurement site ~8.6 h after high tide in Monterey, CA. They are evident in the velocity records up to at least 35-m above the bottom and may be accompanied by high frequency pulses that extend higher. The variation is not caused by direct forcing from the barotropic tidal range as the strongest bores do not exclusively occur during either the spring or neap phase of the barotropic tide. Speculation on the cause for the temporal variation centers on changes in mid-water stratification observed.

**DoD KEY TECHNOLOGY AREA:** Battlespace Environments

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