

Internal tide variability around Japan revealed by modeling and observation

Yasumasa Miyazawa^{1*}, Xinyu Guo¹, Kaoru Ichikawa², Toru Miyama¹, Sergey Varlamov¹, Takuji Waseda¹, Sourav Sil¹

¹JAMSTEC, ²Kyushu University

Recent development of ocean modeling allows concurrent simulation of the ocean circulation and tide. Investigation of possible occurrence of their interactions is of importance for deeper understanding of the oceanic phenomena. Internal tide is one of key processes that are responsible for the interactions between the ocean circulation and tide. The Izu-Ogasawara Ridge south of Japan is considered as an active generation site of internal tide. We try to detect M2 internal tide signals there from products of the operational tide-resolving ocean circulation model (JCOPE-T) and satellite altimeters (Topex/Poseidon, Jason-1, 2). The amplitude of simulated M2 internal tide harmonics agrees with the observed one, while the simulated phase structure is not much similar to the observation. The model result indicates standing wave features associated with remote propagation of the M2 internal tide south of Japan. We discuss possible modulation of the M2 internal tide variability due to mesoscale eddies and its implications on the vertical mixing and river runoff processes.

Keywords: Eddies and mesoscale processes, Internal and inertial waves, Surface waves and tides