Three Dimensional Modeling of Nonlinear Internal Waves in the Gulf of Oman Shelf Region

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Abstract

The occurrence of nonlinear internal waves in the Gulf of Oman had been proved from recording Synthetic Aperture Radar (SAR) images and processing of their signatures. Most of these internal wave packets were observed in the Gulf of Oman shelf region at the east of Musandam Peninsula. In this study, the formation of nonlinear internal waves from the internal tide has been simulated using three dimensional, non-hydrostatic and fully nonlinear MITgcm model. The model results showed the formation of non-linear internal solitary wave packets at the Gulf of Oman shelf region. The numerical results of this study have been compared with SAR observations and published literatures which showed that the present work at some parameters (e. g. internal wave packet separation and the number of internal solitary waves in the packets) is closer to the radar observations rather than previous published literatures.