



## **Modeling the formation and scattering of internal tides near where the Kuroshio crosses the Ilan Ridge off the northeast coast of Taiwan**

C. Horton and M. Clifford  
Naval Oceanographic Office, USA  
(charles.w.horton@navy.mil)

A modeling system forecasting the circulation of the East China Sea is used to study internal tides (and lee waves) in the vicinity of the strait east of northern Taiwan where the Kuroshio current flows over the Ilan Ridge as it enters the East China Sea. Our modeling system is generally well suited for this study with a spatial resolution of about 2 km in the horizontal and 47 levels in the vertical, and because it uses realistic bathymetry with minimal smoothing. The model resolution is also high enough to allow for a realistically swift and narrow Kuroshio current. The forecast system is built around a version of the Princeton Ocean Model (POM) in which the original pressure gradient scheme has been modified to allow arbitrarily steep bathymetry to be used. In its normal usage, the modeling system is forced by winds and tides and through the assimilation of sea-surface temperatures and temperature/salinity profiles. The primary focus of the study is the formation and scattering of internal tides at the Ilan Ridge off the northeast coast of Taiwan. The processes there are complex because of the direct and indirect affect of the Kuroshio on the formation and refraction of the internal tides. In addition, strong internal tides are also formed nearby, especially along the shelf break just northeast of Taiwan. During our study period two drifting profilers in the Kuroshio passed by Taiwan. The temperature/salinity profiles from them were assimilated, allowing a more realistic Kuroshio path. These profilers also made additional "bounce cycles." The bounce cycles consist of 7 consecutive shallow profiles at 2-hour intervals, and they have been used to do a limited evaluation of the model forecast results.