

## **Development of a high-resolution Japanese coastal ocean model toward operational monitoring and forecasting**

Kei Sakamoto, Hiroyuki Tsujino, Hideyuki Nakano, Mikitoshi Hirabara and Goro Yamanaka

Oceanographic Research Department, Meteorological Research Institute, 1-1, Nagamine, Tsukuba, Ibaraki, 305-0052, Japan.

E-mail: ksakamot@mri-jma.go.jp

We have been developing a Japanese coastal ocean model to provide a platform for the next-generation monitoring and forecasting system of the coastal seas which is planned by Japan Meteorological Agency (JMA) for upgrading of information service about disaster prevention and oceanic conditions. With the horizontal resolution of approximately 2 km, which is five times as high as that of the current ocean model of JMA, the new model can represent explicitly coastal topographies and phenomena with scale of 10 km, which are almost ignored in the current model. In addition, several physical schemes important for coastal seas, such as a vertical mixing scheme suited for bottom boundary mixing, are incorporated into the model. Especially, tidal motion, which is a dominant phenomenon in coastal and shelf seas, is introduced explicitly and precisely into the model by developing an original scheme. Some experiments using this scheme verified that tidal height variation in the model corresponds well with coastal tidal observations by JMA, and showed that strong tidal currents (up to 1 m/s) in coastal areas and active internal tides in offshore areas are represented realistically. Results of an experiment for the seasonal variation over one year will be also shown with focus on roles of tide in the presentation.