Geophysical Research Abstracts, Vol. 7, 01590, 2005
SRef-ID: 1607-7962/gra/EGU05-A-01590

Analysis of temperature and salinity variations in the subtropical and tropical Pacific Ocean using optimal interpolated Argo floats

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Monthly mapping of temperature and salinity using the optimal interpolation method (OI) in the Pacific is conducted with the Argo floats, the TRITON buoys and available CTD casts. Due to many Argo floats, the number of available data for the analysis is increasing from 106 in January 2001 to 1332 in August 2004 and interpolation error is decreasing. We validate the mapping using CTD cast data along 137 E with seasonal climatology and standard deviation obtained by the observations for over 30 years. Differences of temperature and salinity between the CTD and the mapping are smaller than the standard deviation (1 sigma) in almost region except for mesoscale eddy, the variation scale of which is smaller than the decorrelation radius. Area-averaged distribution of the difference of temperature and salinity is smaller than the averaged standard deviation and interpolation error. From the validation, the detecting of large scale variations for temperature and salinity become possible. Variations of surface and subsurface temperature anomaly in the south of Japan display that warming situation about +1.0 degree is continuing from early 2001. Especially, the maximum warming in the surface can be seen in 2001 summer, it corresponds to the extra high tide at Naha, Japan in August 2001. This supports the result of analysis for surface/subsurface temperature variation in previous studies. We also investigate surface salinity variation associated with 2002/03 El Nino in the tropical Pacific Ocean. The pattern of the salinity variation, which is moving from the western Pacific to the central Pacific, is corresponds with atmospheric condition (Outgoing Longwave Radiation, Precipitation rate and Wind stress) and Nino3 index. The variations of barrier layer thickness is also corresponds with the El Nino.