Evaluation of middle depth currents of NCEP Reanalysis in Tropic Pacific using Argo float position information

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In order to obtain reliable velocity information from ARGO float trajectory points, a rigorous quality control scheme presented at there is applied and rejects a quarter of the trajectories points. 7,448 velocity vectors at 1000db depth in Tropic Pacific derived from the ARGO float position information in the period of November 2001 to August 2004 are used to evaluate the intermediate currents of the National Centers for Environmental Prediction reanalysis. The velocities from the reanalysis are trimmed to match the time-space distribution of the ARGO velocity vectors. Based on both the velocities magnitude and the space-time average currents, there are some significant discrepancies as follow: firstly, the NCEP reanalysis velocities are less than that observed by ARGO at most. The average speed difference between them is nearly to –2.0 cm/s. Secondly, the zonal flows in the Equatorial Intermediate Current are westward and the South Equatorial Countercurrent along 5 ^{o}S is eastward, they are all much strong than those in the observation by ARGO, especially in the western Pacific. Thirdly, the westward flow along 5 ^{o}S at east Pacific is underestimated in the reanalysis. Furthermore the reanalysis meridional flow along the equator is weaker than the observed. Thus it is obvious the quality control measures are successful and necessary to assimilate the velocity formation into the ocean model.

Keywords: trajectory; quality control; middle depth current; the South Equatorial Countercurrent

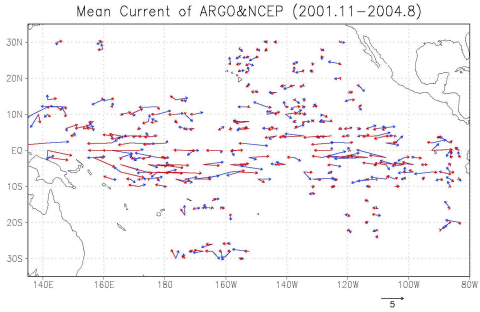

Figure 6: Mean flow field based on 2ºx3º boxes at 1000db. Data are only shown where more than four data points occurred in each box, and the scale for the mean flow is 5cm/s.
Blue: for ARGO; Red: for NCEP

References

[1] Davis, R.E, *J.Geophys.Res.*,103(C11), 24,619-24,639(1998).
[2] Yasuko Ichikawa, Yasushi Takatsuki, Keisuke Mizuno, Nobuyuki Shikama and Kensuke Takeuchi, *ARGO Technical Report FY2001*, JAMSTEC, 68-77(2002)