Geophysical Research Abstracts,
Vol. 10, EGU2008-A-04449, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-04449
EGU General Assembly 2008

Submesoscale coherent vortices in the California Current System as observed by looping RAFOS floats

C. Collins, T. Margolina, and T. Rago

Department of Oceanography, Naval Postgraduate School, Monterey, California, USA (collins@nps.edu / Phone: 831 656 3271)

In the California Current, submesoscale coherent vortices (SCVs) may play an important role in the offshore transport of nearshore and equatorial waters from the coastal zone into the interior of the Northeastern Pacific. This is because SCVs retain their core water and travel great distances. Because the coastal salinity anomalies are less distinct than those for Mediterrean water in the Eastern North Atlantic, SCVs are harder to detect in CTD profiles in the Northeastern Pacific Ocean, so little is known of their structure, vertical extent and propagation. This study presents the kinematic characteristics of California SCVs (called California Undercurrent eddies or "cuddies") using trajectories of isobaric RAFOS floats launched off Central California in the California Undercurrent from 1992-2004 at a depth between 150 and 600 m.

About 50 loopers (two or more consecutive loops) were observed. 80% moved westward with a mean speed of 1.9 cm/s. Some of the loopers were long-lived California Undercurrent eddies with diameter of 30-40 km and were transported as far as 1200 km offshore. Some California Undercurrent eddies retained floats for a year or longer. The kinematic characteristics of these eddies, including translation speeds and directions, periods of rotation, and characteristic swirl velocities, were estimated from the float trajectories through spectral and wavelet analysis. Although the cores of the observed submesoscale vortices were approximately in solid body rotation, intensive interactions between deeply penetrating mesoscale eddies and the SCVs were clearly observed in the data and supported by our analysis.