Observations of the poleward undercurrent in the California Current System, 1995-2005

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As one of the oceanographic components of the joint US-Canada hake survey cruises in recent years, velocities were observed with shipboard acoustic Doppler current profiler. A series of velocity sections extending from mid-shelf to mid-slope at about 18 km meridional spacing were collected in 1995, 1998, 2001, and 2003 from Monterey to Vancouver Island (Monterey to Cape Mendocino in 2005). Tidal velocities are estimated and removed using OSU Tidal Inversion Software. Survey-means of all the cross-shore sections reveal significant subsurface poleward flow with a core of 0.1 m/s for each survey. The depth of the maximum poleward velocity varies from 200-300 m. Mean poleward transports range from 0.6-1.0 Sv. The undercurrent core is centered 20-30 km (10-15 km) off the shelf break in 1995 and 1998 (2001 and 2003). These observations generally confirm previous Eulerian as well as Lagrangian studies of the poleward undercurrent, increasing confidence in the robustness of the feature. The undercurrent is notably consistent, especially given the amount of interannual variability in the California Current System in general.