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Southern Ocean hydrography and circulation: Evaluating mixing and stirring in the Southern Ocean with lagrangian floats

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The Diapycnal and Isopynal Mixing Experiment in the Southern Ocean (DIMES) is an ongoing UK/US CLIVAR process study designed to study mixing in the Antarctic Circumpolar Current (ACC). Field work for the program has included tracer release, a moored array for studies of eddy/fine-scale interaction, turbulence measurements, and deployment of Lagrangian floats. In 2009 and 2010, a total of 180 standard RAFOS floats and 44 RAFOS floats with Iridium transmitters were released in the southeastern Pacific Ocean. The floats are quasi-isopcynal and were targeted for the 27.3 and 27.9 neutral density surfaces, with 1-year to 2-year missions. The first group of these were deployed on the deeper isopycnal surface along 105^{o}W between the Polar Front and the Subtropical Front of the ACC. These floats have now yielded 50 usable float trajectories, which will be analyzed to assess along-isopycnal mixing and to evaluate mixing variations with latitude. The observed trajectories are compared with trajectories derived from numerical model experiments and with the background time-averaged flow inferred from Argo data and climatology. Float trajectories will also be used in combination with ocean state estimates to quantify mixing and stirring processes along the steeply tilted isopycnals of the ACC.