## Abstract View

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# Microstructure and Intrusions in the California Current

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ABSTRACT

Two microstructure records taken at shallow depths off Cabo San Lucas, at the southern tip of Baja California, are compared. One is similar to records previously taken in the mid-gyre, and has an “irregularly steppy” appearance, a linear *T-S* relation, and a Cox number of approximately 10. It is suggested that this type of profile may represent the background condition of the ocean in which the levels of vertical turbulence are quite low and the principal dissipation occurs by small-scale shear instabilities at the “step“ structures. The other record exhibits a very irregular *T-S* relation, due to multiple interleavings of the water masses present in the area. Coupled with this is an average Cox number of at least 6000 and a much greater variability in the local microstructure levels along the record; half-meter averages of the dissipation rate of temperature fluctuations show a range greater than $10^6$. In some cases these differences occur over vertical separations of a few meters. In general, the region of intense microstructure activity occur at the vertical boundaries of the intrusions and seem to be the result of shears and double diffuse phenomena associated with the spreading motion of the intrusion and the vertical *T-S* differences. These processes act to dissipate the intrusion as an identifiable feature. Off the California coast the 5 to 30 m thick intrusions which are associated with strong microstructure are produced by the interleaving of northward flowing warm saline Equatorial Water and the southward moving cool fresh California Current. The amplitude and frequency of the intrusions decrease at stations closer to the subtropical gyre.

The presence of similar intrusive features in other locations suggests that they are major factors in the dissipation of fluctuations in the ocean, but microstructure profiles, by themselves, are not sufficient to assess the vertical heat flux associated with them.

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