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EOF Analysis of Central Drake Passage Currents from DRAKE 79

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ABSTRACT

A rotary Empirical Orthogonal Function analysis was performed on the current meter observations made during DRAKE 79 to quantify current variability in central Drake Passage in the vicinity of the Polar Front. Two forms of variability are revealed by the analysis: a large scale north-south shift of the Polar Front and meandering of the Polar Front. The frontal shift influences the current at the three nominal observation levels (500 m, 1400 m, 2500 m) over most of the central passage, with a time scale of about three months. Variability associated with meanders (also warm-core and cold-core rings) extends over the whole central passage. Currents as far south as ML-10 are influenced by rings that pass by the northern side of the MS array. These events occur at somewhat regular intervals of one and a half to two months.

This analysis shows that the rugged bottom topography in the central part of Drake Passage plays a dominant role in the variability of the currents. Additionally, the strong current associated with the Polar Front tends to flow around the seamounts located in the central passage. Steering also affects the cold-core rings which travel through the region.

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