ADCP Observations across the Labrador Sea during IPY 2008

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Introduction

The Labrador Sea has long been recognized as an important region for deep convection and intermediate water mass formation. The boundary current system which dominates the circulation of the Labrador Sea provides a pathway for transporting newly ventilated water masses formed locally and further upstream, including Denmark Strait Overflow Water, Iceland–Scotland Overflow Water, and Glibbe Fracture Zone Water. Since 1990, scientists from the Bedford Institute of Oceanography (BII) in Dartmouth, Nova Scotia, have continuously occupied the CLIVAR (previously WOCE) repeat line [AR7W transect] in order to measure the hydrographic properties of the Labrador Sea. Since 1995, in collaboration with investigators from the Woods Hole Oceanographic Institution, shipboard Acoustic Doppler Current Profiler (SADCP) and Inverted Acoustic Doppler Current Profiler (LADCP) data have been collected along with the hydrographic data. As part of an on-going effort to process and analyze these data, we present here a description of the methods used to process the SADCP and LADCP data sets. To commemorate the end of the International Polar Year (IPY), we present results from the AR7W cruise from May, 2008 (Figure 1A). These data are being used to determine the absolute velocity across the Labrador Sea each year during the time of the AR7W occupation. We will continue collecting these data on an annual basis to strive to determine the interannual and/or long-term variability in the region and how it relates to polar climate and the Atlantic Meridional Overturning Circulation.

Figure 2a: Before calibration

Figure 2b: After calibration

Figure 3a: Shear only

Figure 3b: GPS only

Figure 3c: GPS + BOT

Figure 3d: LADCP only

Figure 3e: LADCP + SADCP

Figure 3f: GPS only

Figure 4a: Before referencing

Figure 4b: After referencing

Figure 5a: H2008 AR7W LADCP/SADCP (100 - 400 m mean)