

A first look at AMOC branches through the Charlie-Gibbs Fracture Zone from a two-year moored array.

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While intense observational effort has recently been made to describe the basic structure and (in some cases) low-frequency variability at a few locations along the paths of the AMOC, relatively little attention has been paid to the Charlie-Gibbs Fracture Zone (CGFZ), a gateway for both the warm and cold limbs of the AMOC over the Mid-Atlantic Ridge. A combined observational and modeling study of the AMOC at the CGFZ is underway, with primary objectives being: (1) to obtain an improved direct estimate of the mean and low frequency variability of the deep westward transport of Iceland-Scotland Overflow Water through the CGFZ and (2) to gain a better understanding of the causes of the low-frequency variability in the transport of overflow waters through the CGFZ, especially of the role of the eastward-flowing North Atlantic Current in generating this variability. An array of eight current meter and hydrographic moorings was installed across the CGFZ for two years beginning in July 2010 (with ship time provided by M. Rhein, University of Bremen) to measure the currents and water properties between the bottom and 500 m. This array provides the first long-term, simultaneous observations of both the westward and eastward flows over the CGFZ. In addition to fixed microcats and current meters, moored profilers were deployed on three of the moorings for an exploratory study of diapycnal mixing intensity in the CGFZ. The array complements other long-term time series measurements being made in the area by M. Rhein. This study will provide a transport benchmark for critical evaluation of climate models.