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Export of Labrador Sea Water through Flemish Pass

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In the Labrador Sea of the North Atlantic the Labrador Sea Water (LSW) is formed at times of deep convection events. LSW propagates southward as part of the Deep Western Boundary Current (DWBC) which constitutes the cold return flow of the climate relevant Atlantic meridional overturning circulation (AMOC). Changes in the AMOC strength modulate climate variability; such changes are thought to be linked to variations in LSW formation.

Topographic obstacles at the southern exit of the Labrador Sea split the DWBC into an upper branch carrying LSW through Flemish Pass (∼1200m sill depth) and a branch carrying all DWBC components along the continental slope around Flemish Cap. Up to now, transports of LSW through Flemish Pass and their contribution to the AMOC are still uncertain, the importance of the pass for the export of LSW and its associated variability is yet unknown.

Based on observations and model data, in this project we investigate the magnitude of LSW transports and its associated variability through Flemish Pass as well as the processes which drive the variability. For this reason two moorings were deployed in Flemish Pass in summer 2011 and will be recovered and redeployed in summer 2012. Here, first results from available ship-based measurements of hydrography and current velocity are presented.