



Transport of Iceland-Scotland Overflow waters in the Deep Western Boundary Current along the Reykjanes Ridge

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Since 2014, an array of current meters deployed as part of the OSNAP trans-basin observing system has provided new measurements of the southward flow of Iceland-Scotland Overflow water (ISOW) along the eastern flank of the Reykjanes Ridge in the Iceland Basin. The location of the array, near 58-59°N, captures the ISOW Deep Western Boundary Current at the farthest downstream location in the Iceland Basin before significant amounts of ISOW can flow into the Irminger Basin through deep fractures in the Reykjanes Ridge. The transport of the ISOW DWBC at this location - based on the first two years of OSNAP observations (July 2014 to July 2016) - is 5.8 ± 0.9 Sv for $\sigma_\theta > 27.8$. Most of this transport is carried in a main branch of the DWBC along the upper ridge crest in depths from 1400-2200 m, while a secondary branch in depths of 2400-2700 m along the lower ridge crest carries about 1 Sv. The branching of the DWBC at this location is consistent with numerical model results and is caused by an upstream topographic plateau at mid-depths along the ridge crest. The T-S properties of the flow and backward trajectories computed from high-resolution FLAME and VIKING models confirm that the flow in both branches is derived from ISOW and its entrainment products. The transport of the ISOW plume varies over a considerable range, from about 2-10 Sv on weekly to monthly time scales (std. dev. = 2.4 Sv); however the mean currents from two individual year-long deployments are very similar and indicate a robust mean flow structure. The observed ISOW transport at this location is larger by almost 2 Sv than previous values obtained (mostly) farther north in the Iceland Basin, suggesting that additional entrainment into the ISOW plume occurs as it approaches the southern tip of the Reykjanes Ridge.