



## **Connections between North Atlantic eastern and western Subpolar Mode Waters**

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The northeastward extension of the North Atlantic Current (subarctic front) divides the Subpolar Mode Waters (SPMW) into eastern and western portions. The eastern SPMW feeds the Iceland-Faroe Front and the Norwegian Current, the western portion participates in the formation of the Labrador Sea Water. The thickest layers of SPMW are associated with topography or strong fronts. A particularly homogeneous pool of western SPMW is found along the Reykjanes ridge; an eastern pool is associated with the Iceland-Faroe front. The relation between the eastern and western portion of SPMW is investigated with hydrographic and Lagrangian data. Isopycnal floats show that the subsurface circulation in the Iceland basin is cyclonic (Bower et al., 2002) and this feature contributes to the hypothesis of considering the eastern SPMWs the source for the western ones. In contrast, although surface drifters clearly show the northeastward subarctic front on the western side of the Iceland basin, they do not track the southwestward current on the eastern flank of the Reykjanes ridge. Therefore, the surface circulation does not support a direct connection between the two mode waters. Also water mass properties do not support the argument of direct transformation of eastern mode waters to the western ones, through either isopycnal advection or diapycnal mixing. Thus, we hypothesize that the eastern SPMWs cannot be the only source for the western SPMWs, but another water mass source, in addition to it, is necessary. This additional water mass might be the water carried by the subarctic front since its properties are such that a mixture with the eastern SPMWs could result in the properties of the western SPMWs.