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Wind Stress and hydraulic Forcing Mechanisms of the Denmark Strait Overflow

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The Denmark Strait Overflow is the densest source of North Atlantic Deep Water and thus an important part of the Atlantic Meridional Overturning Circulation.

Continuous overflow observations from 1999 to 2004 carried out by IFM-GEOMAR Kiel and MRI Reykjavík exhibit significant interannual variability both in water mass properties and transport.

From 1999 to 2003, the volume transport decreased from 3.7 to 3.1 Sv. The transport reduction is related to both a dense water reservoir height decrease northeast of the Denmark Strait sill, and a reduced wind stress forcing over the Iceland Sea. There is thus evidence that the Iceland Sea region is critical in controlling the Denmark Strait Overflow. The overflow time series are analysed to evaluate the effects of both forcing mechanisms.