Variability in the Irminger Sea: new results from continuous ocean measurements between 2014–2015

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The subpolar gyre and the Irminger Sea
Overturning of the Subpolar North Atlantic Program (OSNAP)

USA, UK, Canada, Germany, Netherlands, France, China
Overturning of the Subpolar North Atlantic Program (OSNAP)

Dutch contribution to OSNAP East:

**F:** LOCO profiling mooring in the central gyre (time series since 2003)

**G:** 4 tall moorings in the Irminger Current (IC) on the Reykjanes Ridge

Cruise 64PE400 July 2015 with RV Pelagia
Irminger Sea mean hydrography 1990s vs 2000s

Våge et al., 2011
Irminger Sea mean hydrography 1990s vs 2000s

Våge et al., 2011
Irminger moorings deployed in 2014

Background: absolute geostrophic velocity (Våge et al., 2011)
Time series of potential vorticity (PV) in the Irminger Gyre

De Jong & De Steur, in prep
Time series of potential vorticity (PV) in the Irminger Gyre

Deepest convective MLD since 2003 found in winter 2014–2015
Associated with large atmospheric heat flux and a positive NAO

De Jong & De Steur, in prep
Irminger Sea hydrography & velocity 2015

Newly and locally formed Labrador Sea Water

A single Irminger Current (IC) core
Newly and locally formed Labrador Sea Water

A single Irminger Current (IC) core
Absolute Dynamic Topography

July-Oct 2014

Feb-May 2015
Absolute Dynamic Topography

July-Oct 2014

Feb-May 2015

Variable meandering
Multiple branches
11-month mean northward transport $10.1 \pm 3.6 \text{ Sv}$
Summer section estimate (hydro+LADCP) 9.1 Sv
Volume transport Irminger Current 2014–2015

11-month mean northward transport 10.1±3.6 Sv
Summer section estimate (hydro+LADCP) 9.1 Sv

Feb-April: increased transport and variability
Conclusions

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- LSW was produced locally and filled the Irminger basin
- The IC displayed a single core in July 2015 similar to the conditions observed in the 1990s
- The IC shows high variability, particularly during winter
- Annual mean transport of IC was 10.1 Sv
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