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Evidence of Greenland Sea Water at 24 degrees N from the Greenland Sea Tracer Experiment

M.-j. Messias (1), A. J. Watson (1), P. J. Brown (1,2), and B.A. King (3)

(1) University of East Anglia, School of Environmental Sciences, Norwich, United Kingdom (m-j.messias@uea.ac.uk), (2) British Antarctic Survey, Cambridge, United Kingdom (p.j.brown@uea.ac.uk), (3) Southampton Oceanography Centre, Southampton, United Kingdom (b.king@noc.soton.ac.uk)

Several plumes of the tracer sulphur hexafluoride (SF_6) released in the Greenland Sea in 1996 were identified at 24°N in the North Atlantic during a hydrographic section performed in January 2010. The tracer was initially injected along the isopycnal σ_θ= 28.045 kg/m^3, tagging warm and salty Greenland Sea Arctic Intermediate Water at around 300 m depth. Subsequently, the tracer was found in the Icelandic Basin in 2001 and in the Irminger Basin in 2003 within Iceland Scotland Overflow Water (ISOW) and Denmark Strait Overflow Water (DSOW). The tracer plumes along 24°N were respectively found in the deepest part of the Florida Strait within DSOW, in the Deep Western Boundary Current, and on the eastern side of the Mid-Atlantic Ridge within ISOW. These observations reveals the presence of intermediate water from the Greenland Sea in North Atlantic Deep Water as far south as 24°N with a transfer time upper limit of 13 years. The tagged ISOW core was observed between about 1200 and 2000 m depth (27.65 kg/m^3 $< \sigma_\theta <$ 27.82 kg/m^3) from 47°W to 40°W longitude, revealing a relatively substantial southward flow along the eastern flank of the Mid-Atlantic Ridge.