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Support of Publication Costs, Atlantic Meridional Overturning Circulation Special Issue of Deep Sea Research II Journal
Final Technical Report

The contribution of funds from DOE supported publication costs of a special issue of Deep Sea Research arising from presentations at the First U.S. Atlantic Meridional Overturning Circulation (AMOC) Meeting held 4-6 May, 2009 to review the US implementation plan and its coordination with other monitoring activities.

The special issue includes a total of 16 papers, including publications from three DOE-supported investigators (ie Sevellec, F., and A.V. Fedorov; Hu et. al., and Wan et. al.,). The special issue addresses DOE interests in understanding and simulation/modeling of abrupt climate change.

US AMOC meeting in Annapolis that motivated most of the papers in this issue began with a summary of the current observing/monitoring program and presentation of results based on that observation set including deriving heat transport estimates.

Two studies, *Gary et al. (2010)* and *Bower et al. (2010)*, add an additional wrinkle to the problem of monitoring the deep limb of the overturning circulation by suggesting the existence of an interior pathway for water which would thus escape detection by western boundary monitoring arrays. The latter study proposes a Lagrangian approach that could track the 'missing' water transport. *Rhein et al. (2010)* suggest improved methods of tracking overturning transports in the subpolar gyre. *Baehr (2010)* explores the potential to develop 'fingerprints' among easily tracked variables that would allow one to estimate transport across the 26.5^{o}N line – the broader issue of fingerprint detection is also discussed in *Mahajan et al. (2010)*. Finally, *Garzoli and Matano (2010)* complete this discussion by reviewing AMOC in the Southern Hemisphere and the opportunities for monitoring key aspects of AMOC at those latitudes.

The remaining papers in this volume address related broader issues. *Munoz et al. (2010)* explore the question of whether current reanalyses (also known as syntheses) of ocean circulation created by using hydrographic and altimetric observations as constraints for numerical models can provide a method of monitoring AMOC on the basin-scale. Their study shows that there is still wide disagreement among the reanalyses. *Heimbach et al. (2010)* exploits inverse methods to conduct a series of Observing System Simulation Experiments exploring how best to monitor the AMOC. The twin subjects of climate variability and predictability/prediction are discussed in an overview paper by *Latif and Keenlyside (2010)* and in a general circulation model-focused paper by *Mahajan et al. (2010)*. Finally, the potential for abrupt climate change and some of its worrisome consequences is discussed in three papers, the relationship to model bias (*Wan et al.,*

2010), the consequences of Greenland ice melt on AMOC (*Hu et al., 2010*), and the stability of the climate system itself (*Sévellec et al., 2010*).