Auxiliary material for

**Abyssal ocean warming around Antarctica strengthens the Atlantic Overturning Circulation**

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Introduction

The auxiliary material contains four figures: 2014GL059923R-fs01.eps, 2014GL059923R-fs02.eps, 2014GL059923R-fs03.eps and 2014GL059923R-fs04.eps. These figures have been realized using the model outputs from ORCA05. The captions of the figures are detailed below.

1. 2014GL059923R-fs01.eps (Fig. S1) Potential temperature evolution (°C) as a function of depth averaged over the Weddell Sea. Full black line: CTRL experiment; red dashed line: WARM experiment.

2. 2014GL059923R-fs02.eps (Fig. S2) Potential temperature averaged over the AABW layer (defined as in Fig. 1) in DIFF. Left: global ocean; right: zoom in the western South Atlantic Ocean. (a,b) Average over years 11 to 20 of DIFF; (c,d) average over years 41 to 50 of DIFF; (e,f) average over years 71 to 80 of DIFF. The star shows the location of the Vema Channel.

3. 2014GL059923R-fs03.eps (Fig. S3) Linear trend of AABW thickness computed over years 21 to 90 of DIFF. The thickness of AABW is defined as the depth range of water masses having a potential density referenced to 4000 m higher than 45.91 kg m-3. Spatial smoothing has been applied to enhance visual clarity.

4. 2014GL059923R-fs04.eps (Fig. S4)West minus east difference of annually-averaged density in DIFF. Potential density is referenced to 4000 m depth (σ4) and averaged over 34°S-29.5°S; 62°W-40°W for the western box and over 34°S-29.5°S; 6°E-23°E for the eastern box.