

Model output used for:

**Variability and trends in Southern Ocean eddy activity in 1/12° ocean model simulations,** Lavinia Patara<sup>1</sup>, Claus W. Böning<sup>1</sup>, Arne Biastoch<sup>1</sup>

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The following model experiments were analyzed for the paper:

- ORCA025-KLP027: 1/4° horizontal resolution, integrated under COREv.2 normal year forcing, includes 3-D Antarctic Bottom Water relaxation. Initial conditions: Levitus, model length: 90 years.
- ORCA025-KLP030: 1/4° horizontal resolution, integrated under COREv.2 normal year forcing, does not include 3-D Antarctic Bottom Water relaxation. Initial conditions: Levitus, model length: 120 years.
- ORCA025-KLP031: 1/4° horizontal resolution, integrated under COREv.2 interannual forcing from 1948 to 2007, includes 3-D Antarctic Bottom Water relaxation. Initial conditions: year 31 of KLP027, model length: 60 years.
- ORION12-KLP002: host model at 1/4° resolution and a nested model at 1/12° in the ACC regime, integrated under COREv.2 normal year forcing, includes 3-D Antarctic Bottom Water relaxation. Initial conditions: Levitus, model length: 90 years. The outputs of the nested model have a "1\_" preceding the output file name, whereas the outputs from the host model do not.
- ORION12-KLP003: host model at 1/4° resolution and a nested model at 1/12° in the ACC regime, integrated under COREv.2 interannual forcing from 1948 to 2007, includes 3-D Antarctic Bottom Water relaxation. Initial conditions: year 31 of KLP002, model length: 60 years. The outputs of the nested model have a "1\_" preceding the output file name, whereas the outputs from the host model do not.

The model output is in netcdf format. Following is a table containing (column 1) the name of the output file, (column 2) the variable contained as well as its temporal resolution, (column 3) the missing years, and (column 4) the figures in the paper where the output was used.

Name	Variable	Remarks	Usage
1_ORION12-KLP002_1y_0030010 1_00891231_eke.nc	Eddy kinetic energy at 100 m depth → annual means	Missing years: 0084. For linear fit computation, this year has been substituted with the average of the previous and subsequent years.	Figure 2, Figure 3, Figure 4, Figure S1b, Figure S2, Figure S5
1_ORION12-KLP003_1y_1948010 1_20071231_eke.nc	Eddy kinetic energy at 100 m depth → annual means	Years 1964, 1995, 1996 are corrupt. EKE from the host model is used instead.	Figure 2, Figure 3, Figure 4, Figure S1b, Figure S2, Figure S5
ORION12-KLP002_1y_0030010 1_00891231_eke.nc	Eddy kinetic energy at 100 m depth → annual means	Missing years: 0065, 0070. For linear fit computation, these years have been substituted with the average of the previous and subsequent years.	Figure 2, Figure 3, Figure 4, Figure S1b, Figure S2, Figure S5
ORION12-KLP003_1y_1948010	Eddy kinetic energy at 100 m		Figure 2, Figure 3, Figure 4, Figure

1_20071231_eke.nc	depth → annual means		S1b, Figure S2, Figure S5
ORION12- KLP003_1y_1958010 1_20071231_eke_uv_ geo.nc	Surface geostrophic EKE → annual means		Figure S5
1_ORION12- KLP003_1y_1958010 1_20071231_eke_uv_ geo_no_88_89.nc	Surface geostrophic EKE → annual means	Missing years: 1988, 1989. EKE from the host model is used instead	Figure S5
ORION12- KLP002_1m_0030010 1_00891231_drake.nc	ACC transport at Drake Passage → monthly means		Figure S1c
ORION12- KLP003_1m_1948010 1_20071231_drake.nc	ACC transport at Drake Passage → monthly means		Figure S1c
ORCA025- KLP027_1y_0030010 1_00881231_drake_n o34_39_63_69.nc	ACC transport at Drake Passage → annual means	Missing years: 0034, 0039, 0063, 0069. For linear fit computation, these years have been substituted with the average of the previous and subsequent years.	Figure S1a
ORCA025- KLP030_1y_0000010 1_01201231_drake.nc	ACC transport at Drake Passage → annual means		Figure S1a
ORION12- KLP003_1y_1948010 1_20071231_no49- 51_90_03_mocsig2.nc	Global meridional overturning circulation stream function in density coordinates (sigma referenced at 2000 m depth) → annual means	Missing years: 1949, 1950, 1951, 1990, 2003	Fig. S1d
ORION12- KLP002_1y_0040010 1_00891231_mocsig2 _no65_80.nc	Same as above	Missing years: 0065, 0080. For linear fit computation, these years have been substituted with the average of the previous and subsequent years.	Fig. S1d
ORION12- KLP003_1y_1948010 1_20071231_taux.nc	Zonal wind stress → annual means		Figure 4, Figure S2
ORION12- KLP003_1y_1948010	Meridional wind stress		Figure 4, Figure S2

1_20071231_tauy.nc	→ annual means		
ORION12- KLP003_clim_194801 01_20071231_psi.nc	Barotropic stream function → climatology		Figure 2a
1_ORION12- KLP003_1y_1948010 1_20071231_sshvar.n c	Sea surface height variance → annual means	Missing years: 1960, 1990, 1993, 2003	Figure 1
ORION12- KLP003_1y_1992010 1_20071231_sshvar.n c	Sea surface height variance → annual means		Figure 1
ORCA025- KLP031_1y_1992010 1_20071231_sshvar.n c	Sea surface height variance → annual means		Figure 1
1_ORION12- KLP003_5d_2004010 1_20041231_ssh.nc	Sea surface height → 5-day means		Figure S3
1_ORION12- KLP003_5d_2005010 1_20051231_ssh.nc	Sea surface height → 5-day means		Figure S3
ORION12- KLP003_5d_2004010 1_20041231_ssh.nc	Sea surface height → 5-day means		Figure S3
ORION12- KLP003_5d_2005010 1_20051231_ssh.nc	Sea surface height → 5-day means		Figure S3
1_bathy_meter.nc	Bathymetry		Figure 4b
bathy_meter.nc	Bathymetry		Figure 4b
ORION12_mask.nc	ORION12 grid (host model)		
1_ORION12_mask.nc	ORION12 grid (nest model)		
ORCA025_mask.nc	ORCA025 grid		