Supplemental Material

Journal of Physical Oceanography

Skills and Limitations of the Adiabatic Omega Equation: How Effective Is It to Retrieve Oceanic Vertical Circulation at Mesoscale and Submesoscale?

https://doi.org/10.1175/JPO-D-20-0052.1

	data	equation	boundary conditions	depth (m)	dx (m or °) Interpolated grid	dz (m)	Wmax (m/s)	Wmin (m/s)
Allen & Smeed (1996)	Data – Iceland-Faroes	QG	Dirichlet	350	4000	8	1e-3	-7e-4
Allen et al. (2001)	Model – periodic channel	QG	Dirichlet & Neumann	300	1900	10	1e-4	-1e-4
Barcelo_Llull et al. (2016)	Data – Souteast Pacific	QG	Dirichlet	1500	1/3°	-	3e-5	-3e-5
Barcelo_Llull et al. (2017)	Data – Canary Islands	generalized	Dirichlet	400	10000	8	3e-5	-5e-5
Benitez-Barrios et al. (2011)	Data – Canary	QG	Dirichlet	500	5000	15	1e-4	-1e-4
Buongiorno Nardelli et al. (2001)	Data – Mediterranean Sea	QG	Dirichlet	300	8000	8	2e-4	-2e-4
Buongiorno Nardelli et al. (2012)	Data – Gulf Steam	QG	Dirichlet & Neumann	1500	1/20°	-	7e-4	-7e-4
Buongiorno Nardelli (2013)	Data – Agulhas region	SG	Dirichlet & Neumann	1000	1/10°	10	7e-4	-7e-4
Buongiorno Nardelli et al. (2018)	Data – Southern Ocean	generalized*	Neumann	1500	1/4°	-	4e-4	-5e-4
Chen et al. (2020)	Model – anticyclonic warm core ring	generalized*	-	2004	1000	-	2e-5	-2e-5
Estrada-Allis et al. (2019)	Model – anticyclonic eddies	generalized	-	-	5000	20	2e-4	-2e-4
Gil and Gomis (2008)	Data – Cantabrian Sea	QG	Dirichlet & Neumann	700	2400	10	9e-5	-9e-5
Giordani et al. (2006)	Model – North-East Atlantic	generalized*	Dirichlet & Neumann	-	5000	-	5e-5	-5e-5
Legal et al. (2007)	Data – NE Atlantic	QG	Dirichlet & Periodic	300	2000	3	2e-4	-2e-4
Mason et al. (2017)	Data - Brazil- Malvinas Confluence	QG	Dirichlet & Neumann	1000	0.3°	-	2e-4	-2e-4
Naveira Garabato et al. (2001)	Data- Antarctic Polar Front	SG	Dirichlet & Neumann	600	25000	8	3e-5	-2e-5
Pallàs-Sanz (2005)	Data – Alboran Sea	generalized	Dirichlet	250	2900	4	5e-4	-7e-4
Pallàs-Sanz (2010)	Data – California Current System	generalized*	Dirichlet	250	1500	8	1e-4	-1e-4
Pascual et al (2004)	Data - Northwestern Med Sea	QG	Dirichlet & Neumann	600	4000	8	2e-4	-2e-4
Pascual et al. (2015)	Data – Gulf Stream	QG	Dirichlet & Neumann	1500	1/3°	-	2e-4	-2e-4
Pidcock et al. (2012)	Data – Iceland bassin	QG	Dirichlet & Neumann	450	2000	8	6e-5	-6e-5
Pinot et al. (1996)	Model – periodic channel	QG & SG	model derived	200	2000	20	3e-4	-6e-4
Pollard & Regier (1992)	Data – Saragosso Sea	QG	Dirichlet	300	4000	10	4e-4	-4e-4
Qiu et al. (2020)	Model – MITgcm Kuroshio	generalized	Neumann	1000	1/48°	-	4e-4	-4e-4
Rixen & Beckers (2002)	Data - Alboran Sea	QG	Dirichlet	300	0.05°	20	7e-4	-7e-4
Rixen et al. (2003)	Model - Iceland/Faores	QG	Dirichlet & Neumann	300	1900	10	8e-5	-8e-5
Rousselet et al. (2019)	Data - Ligurian Sea	QG	Dirichlet	300	1000	3	1e-4	-1e-4
Rudnick (1996)	Data – Azores front	QG	Dirichlet	300	2300	8	2e-4	-2e-4
Ruiz et al. (2014)	Data – Canary Islands	QG	Dirichlet & Neumann	130	2000	5	2e-5	-2e-5
Ruiz et al. (2019)	Data - Alboran Sea	QG	Neumann	550	2000	5	1e-4	-1e-4
Shearman (2000)	Data – California current	QG	Dirichlet & Neumann	300	2000	10	5e-4	-5e-4
Viudez et al. (1996)	Data - Alboran Sea	QG	Dirichlet	600	30000	1	2e-5	-2e-5
Viudez & Dritschel (2004)	Model – simulated gyres	QG & SG	-	-	-	-	3e-4	-3e-4
Xie et al. (2017)	Data – South China Sea	generalized*	Dirichlet	160	5000	5	7e-5	-5e-5

SI: bibliography table of studies in which the omega equation is used to infer vertical velocities on three dimensional data sets. The choice of inversion is indicated in the column equation and is either Quasi-Geostrophic (QG), Semi-Geostrophic (SG) or generalized. A * indicates that diabatic terms are included. The resolutions (dx and dz) are given for the interpolated field when there is an interpolation. A (-) sign means the information is not given in the paper or that the spacing in non-regular.