

# Ocean circulation: bibliographic tutorial

## 1 Instructions

- 1 Ability of synthesis: take 30min to write a short paper synthesis (less than 1/2 page) based on reading mostly the abstract, conclusions and/or discussions, the key figures and if necessary the introduction and other sections. What are the main ideas of the paper?
- 2 Reading the outline: formulate in maximum one paragraph each the context, problematic, methods, results, conclusions and discussions of the paper.
- 3 Developing a critical view: what are the main limitations of the paper? What elements of the outline do they concern? (e.g. not enough context, inconsistency of the problematic with the context, methods not responding to the problematic or weak methodology, wrong interpretation of results, etc.)

## 2 Selection of articles

### 2.1 Wide audience

- Topography and abyssal mixing: Polzin et al, "Spatial Variability of Turbulent Mixing in the Abyssal Ocean", Science 1997
- Topography and abyssal ventilation: de Lavergne et al, "Abyssal ocean overturning shaped by seafloor distribution", Nature 2017
- Subpolar gyre and climate change: Sgubin et al, "Abrupt cooling over the North Atlantic in modern climate models", Nature Communications 2017
- The thermohaline circulation: Lozier et al, "Overturning in the North Atlantic", Annual Review of Marine Science 2012
- The chaotic ocean variability: Sérazin et al, "A global probabilistic study of the ocean heat content low-frequency variability: Atmospheric forcing versus oceanic chaos", Geophysical Research Letters 2017
- Sverdrup balance in the Tropics: Kessler et al, "Sverdrup and Nonlinear Dynamics of the Pacific Equatorial Currents", Journal of Physical Oceanography 2003

### 2.2 Advanced physics

- Ventilation of the interior ocean: Munk, "Abyssal Recipes", Deep Sea Research 1966
- The red noise ocean: Frankignoul and Hasselmann, "Stochastic climate models, Part II: Application to sea surface temperature anomalies and thermocline variability", Tellus 1977
- Topography and the gyre circulation: Yeager, "Topographic Coupling of the Atlantic Overturning and Gyre Circulations", Journal of Physical Oceanography 2015. *Note: focus only on the gyre circulation, excluding the overturning circulation.*
- The western recirculation gyres: Böning, "On the Influence of Frictional Parametrization in Wind-Driven Ocean Circulation Models", Dynamics of Atmospheres and Oceans 1986

- The ventilated subtropical gyre: New et al, "An Isopycnic Model Study of the North Atlantic. Part I: Model Experiment", Journal of Physical Oceanography 1995
- The Equatorial Undercurrent dynamics: Wacongne, "Dynamical Regimes of a Fully Non-linear Stratified Model of the Atlantic Equatorial Undercurrent" Journal of Geophysical Research 1989