

Robustness and Test Cases working group

remember:

Purpose of the working group at his creation (2015) :

To have a series of test cases in NEMO used for investigating sensitivity to numerical choices with the idea of moving toward a **more robust NEMO**.

1. Provide a tool to quickly **assess the effect of changes** to NEMO model.
2. Provide a **quick and easy-to-execute introduction to NEMO** and give an **overview of the capabilities** of the model.

work done **till 2016** :

- Rewriting configuration interface : new definition of configuration.
- Simplified routines : routines of **few lines** as example are provided (**more readable**)
- a simple user friendly interface `MY_SRC/usrdef_*.F90`

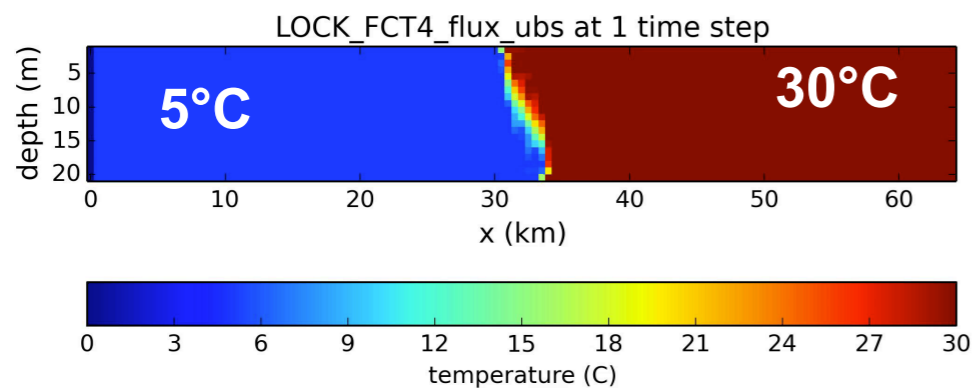
Work done in 2017 : 5 test cases /demonstrator implemented

5 test cases are already committed in the trunk :

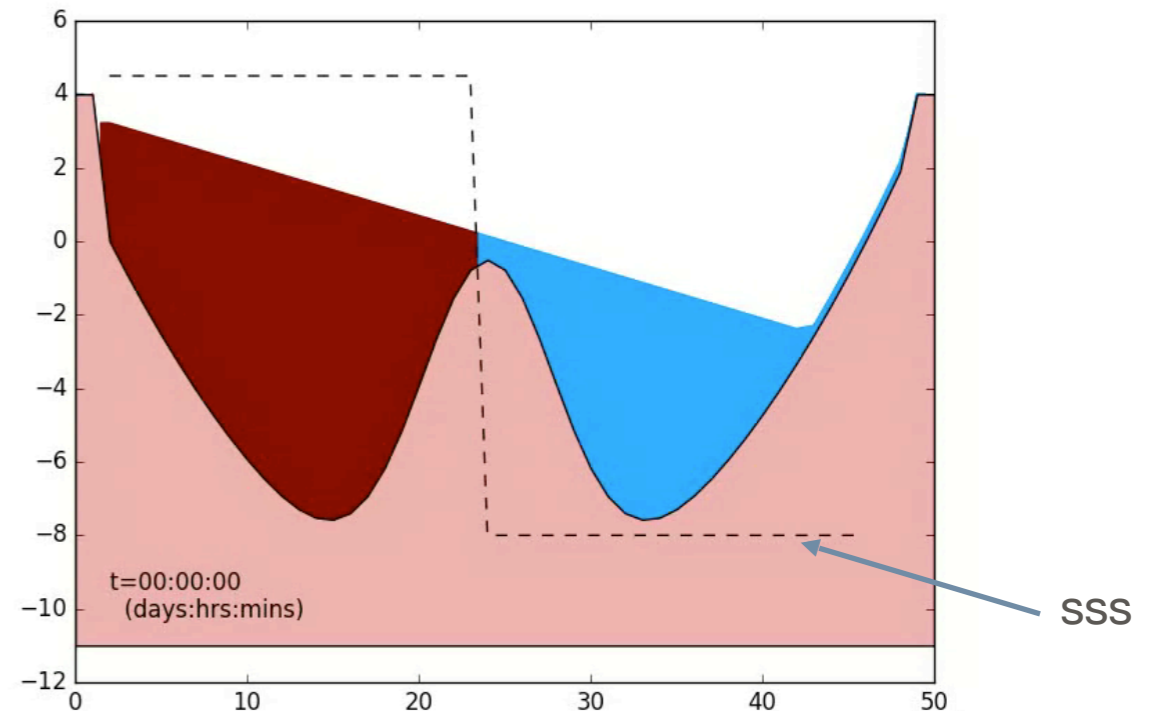
- Lock_Exchange
- Wettind and Drying
- Overflow
- Isomip
- SAS_biper

Lock Exchange (Flavoni S.)

from Ilicak et al. Ocean Modelling 2012



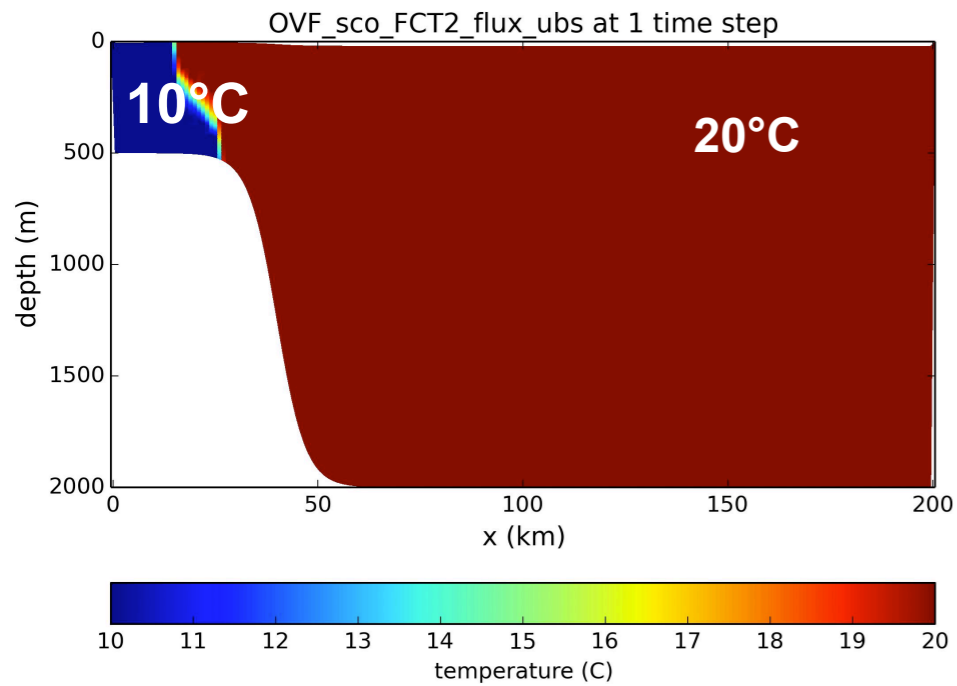
Wetting and drying (Coward A.)



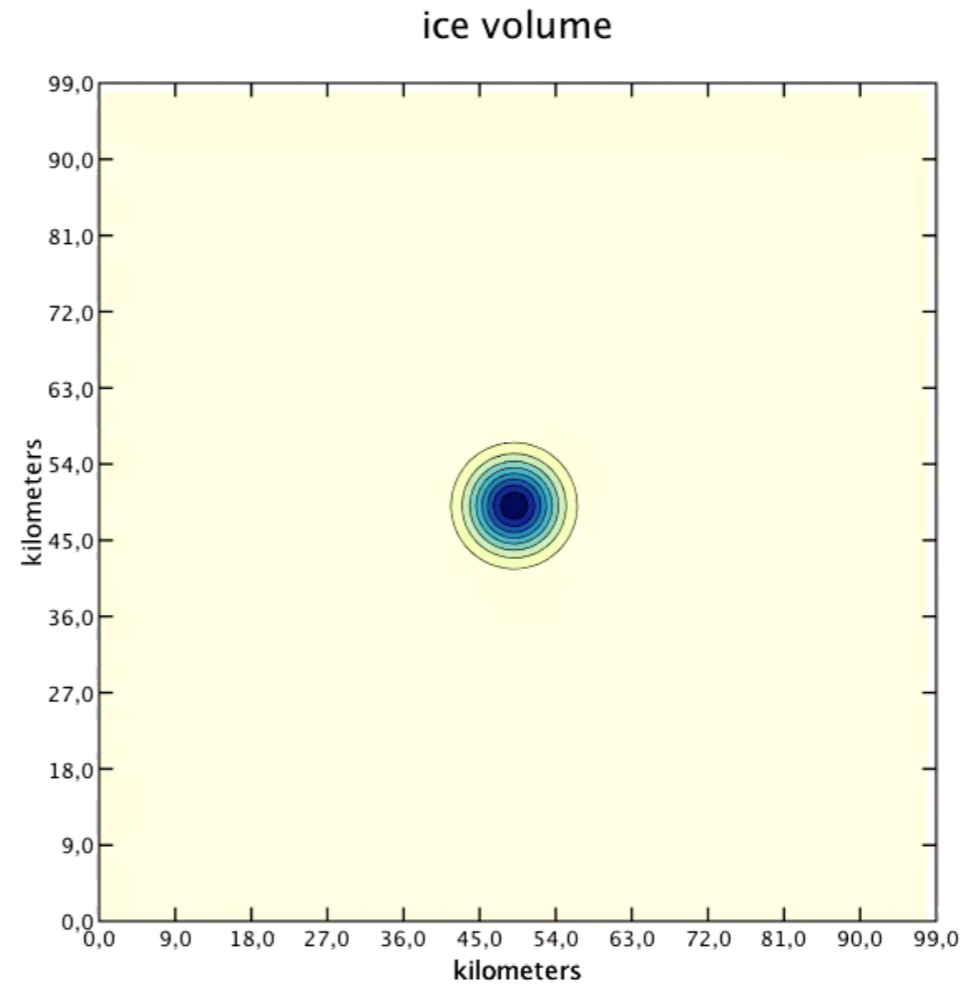
Work done in 2017 : 5 test cases /demonstrator implemented

Overflow (Flavoni. S)

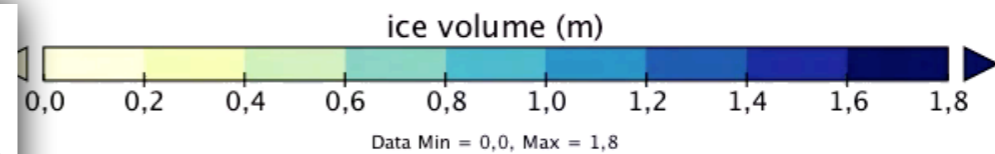
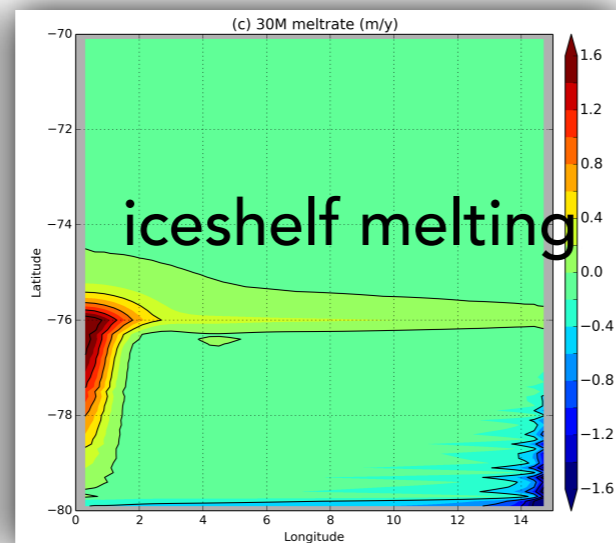
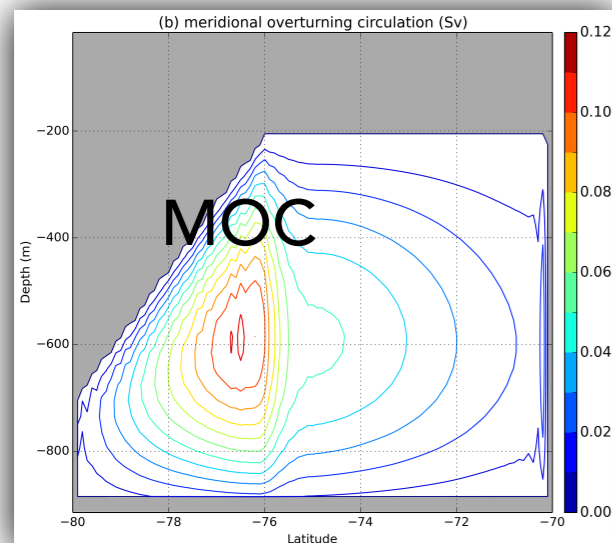
from Ilicak et al. Ocean Modelling 2012



SAS_BIPER (Rousset C.)



Isomip (Mathiot et al. GMD 2017)



Work done in 2017 :

- A test case can be configured by namelist options and user-supplied routines into :

Example: TEST_CASES/**LOCK_EXCHANGE**/MY_SRC :

usrdef_hgr.F90	- defines horizontal mesh and coriolis
usrdef_zgr.F90	- defines vertical grid
usrdef_nam.F90	- reads any specific namelist controls
usrdef_istate.F90	- defines initial state
usrdef_sbc.F90	- defines analytical surface boundary conditions

- a **tool** is created in NEMOGCM/TOOLS : to generate input file
- supply some outputs for the 5 test cases.
- started 2 jupyter notebook (**LOCK_EXCHANGE** and **OVERFLOW**)

pending question ? regarding gyre demonstration case :

WP2017: integrate **SEABASS** in test cases, and maybe it will replace **GYRE** : not done

(P.A.Bouttier no longer in SystemTeam, decision required to keep or not this action)

Open issues for 2017 :

- How to document and maintain informations for using demonstration cases :

Proposed solution :

documenting demonstration cases through jupyter notebooks

- to describe **physical** and **numerical** settings
- to describe the **purpose** of the demonstration case
- to identify **success criteria** (when possible)
- to produce **plots** for each test case (when possible)

Actions by the end of 2017 :

- complete such notebooks (for the overflow demonstration case (example criteria : APE))
- discuss the format within the System Team
- create notebooks for other test cases

Perspectives for 2018 :

action for WP2018 :

- finalize the documentation of the remaining demonstration cases :

Wetting/Drying with A. Coward

ISOMIP with P. Mathiot

SAS_BIPER with C. Rousset

- adding material (based on the notebooks) about demonstration cases on NEMO website

open question :

- define a practical solution for **NEMO users** to **distribute** demonstration cases (according to NEMO development strategy):

- identify a test case of a NEMO user (outside reference version of NEMO)
- investigate how the user can **share** this test case
- investigate how the user can **explain** how to run it (ex : through a personal github repository)

If on Dec 2018 all questions will have the answer the working group will be closed.