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WORKING GROUP ON TEST CASES (draft tbd)

Initial contributors

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Introduction

Simple model configurations (hereafter « test cases ») are often used in the development process of geo-scientific models. A good example of such approach is for instance the [working group on model testing and verification](#) set up for WRF. This trend actually reflects a more general concern about verification and reproducibility of scientific softwares ([see](#)). Within NEMO, a series of test cases has been used for investigating sensitivity to numerical choices during [COMODO](#) project. Arguably, with the idea of moving toward a more robust NEMO, test cases should be used more systematically in NEMO development process. It has been proposed during NEMO Developers Committee in July 2014 to set up a dedicated Working Group on Test Cases. We here propose a roadmap for the activity of this working group.

Motivations

The main motivations for maintaining a suite of test-cases in NEMO are the following :

1. Provide a quick and easy-to-execute introduction to NEMO and give an overview of the capabilities of the model. This is intended primarily for pedagogical purpose (new users, summer schools...).
2. Provide a tool to quickly assess the effect of changes to NEMO model. This is intended for NEMO System Team for for guaranteeing the robustness of code releases and scientific validation of model solutions.

Incidentally, we can expect test cases to be used for guiding choices for NEMO simplification and for promoting systematic model inter-comparison experiments.

Purpose

The purpose of the Working Group on Test Cases is to

1. refine the motivations and establish the guiding principles for setting up test cases in NEMO
2. investigate practical aspects related to the implementation, the distribution and the maintenance of test cases within NEMO.
3. propose recommendations and a list of actions to NEMO Developers Committee for defining NEMO workplan in this respect.

The practical implementation of the recommendations of the working

group will be taken over by NEMO System Team after validation by NEMO developers committee.

Practical questions

Among the practical issues to be discussed by the working group, we have identified the following questions :

- *How should test cases be implemented in the code ?*
 - test cases should be non-intrusive but specific test cases may require local modifications of the code, should we handle this with CPP keys ?
 - in order to minimize the impact on the code, initialization and forcing of test cases may require using external files, is this a problem ?
 - should we make it possible to run test cases at various grid resolutions ?
- *How should test cases be distributed in code releases ?*
 - how should standard output of test cases be specified ?
 - initialization, forcing and diagnostics (plots) will require external libraries to be implemented : should those libraries be part of NEMO ? what language should be used ? python ?
 - what strategy should be set up to ensure the visibility of NEMO test cases ? on NEMO web site ? in summer schools ?
- *How should test cases be used and maintained by the System Team ?*
 - should the test cases be systematically run during merge party ?
 - should one person be in charge of maintaining the all series of test cases or should we share the load ? what about external libraries ?
 - how many test cases should we maintain ? what is the appropriate level of complexity of test cases ?

Timeline

- review how other geo-scientific models handle test cases (POP, WRF)
- identify a group of people willing to work on technical aspects
- organize a series of dedicated meeting targeted on specific questions
- specify a list of test cases to start with (various complexity)
- propose a list of actions for 2016 work-plan.