



NEMO Developers' Committee

June 2021

Kernel Working Group Slides

Mike Bell & team members



Summary of progress/issues this year

- Implementation of Runge-Kutta scheme (sub-group)
 - Analysis of external mode sub-stepping (Ducouso, Lemarie)
 - Flowchart for code (Ducouso, Madec, Techene)
 - Implementation of stp_MLF and stp_RK3 (Techene, Madec)
- Sub-group for generalised vertical coordinates (see web page)
 - Griffies et al Primer on ALE cords (Shao, Debreu)
 - Hofmeister etal (Klingbeil)
 - Gibson PhD thesis (Gibson, Hogg)
 - Plan to summarise issues & options (Debreu, Chanut)
- Presentations at plenary meeting
 - Chris Subich – Toward semi-Lagrangian advection in NEMO
 - Diego Bruciaferri - A multi-envelope s-coordinate system
- Simplified (qco) vertical coordinates (Madec, Techene)
- Shchepetkin & McWilliams (djc) hpg scheme (Young, Bell)

Summary of issues for Strategy (Madec)

- Compensated space-time scheme (RK2 but 3rd order accurate)
- More generalised vertical coordinates
 - using e.g. remapping methods from HYCOM or MOM6
 - advection in vanishing layers
- Brinkman penalisation
 - For improved flow along staircase lateral boundaries
 - Replacing partial cells option
 - Evolving in time for ice shelf cavities and icebergs
- Plan to **stay** with quadrilateral, orthogonal coordinate horizontal grids