

Numerical developments in the SL-AV model

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Implementation of the reduced grid in the SLAV model

- A part of calculations is carried out in space of Fourier coefficients in longitude.
- The semi-Lagrangian advection is used (no nonlinear advective terms)

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Necessary latitudinal derivatives (i.e. geopotential gradient) can be calculated in Fourier space.

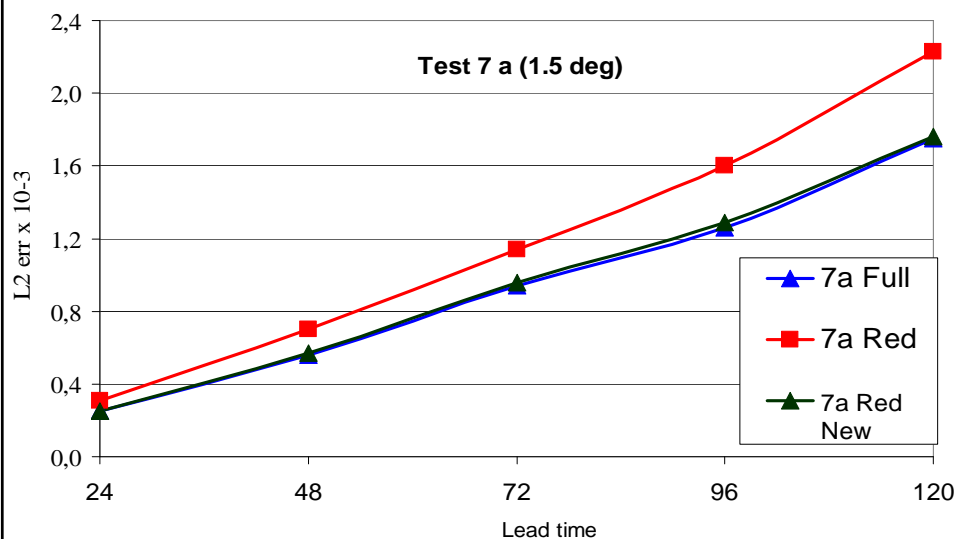
Number of gridpoints at each latitudinal circle should be suitable for FFT.

Currently, implemented in the shallow-water version;
in the debugging phase for the 3D model.

Reduced latitude-longitude grid

- Possesses advantages, provided that its main drawback is removed.
Implemented in the shallow-water version of SL-AV model
- Current implementation requires semi-Lagrangian advection and FFT in longitude.
- 14% reduction in number of points does not deteriorate the results

Shallow water version. Test 7a. Normalized global RMS height error: full and two reduced grids



Reduced grid -3

- Is it possible to construct locally conservative *DIV*, *ROT*, *GRAD* operators directly on the reduced grid?
- Currently, a mass conservative scheme on the reduced grid is being implemented following Nair et al .
- Besides SL-AV model, is considered as a possible candidate for use in future INM CM dynamical core

Thank you!