

Status of jsbach/vdiff integration

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- Integrate vdiff and jsbach into NWP physics: completed
 - GPU port works on levante
- Ocean component ready for coupled simulation
 - Surface stress takes ocean velocities into account
- HD: first tests show too much runoff
 - Soil capacities lower in jsbach than in terra
 - Error in variables sent to HD? Wrong reference area?
- Multiple successful simulations by different people

Merged parts

- Changes to radiation module
(separate fluxes for NIR, VIS, PAR bands & direct and diffuse fractions)
- Repackaging of vdiff
(usable from AES and NWP physics packages, improve encapsulation)
- Preparations for jsbach use
(call init functions when needed, IAU processing, support init from output)

To be done

- Interface (merge request is prepared, awaiting Prototype 2)
- GRIB handling (difficult, but required in DA cycle)

Proto2 merged
yesterday!

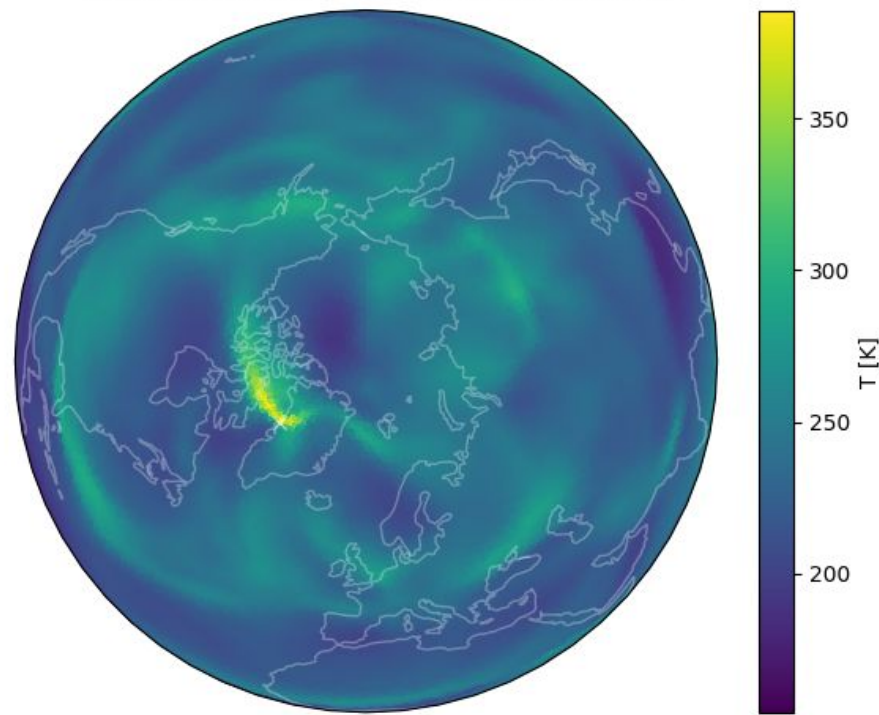
Caveats

vdiff uses a lookup table for water
vapor pressure limited to 400K.

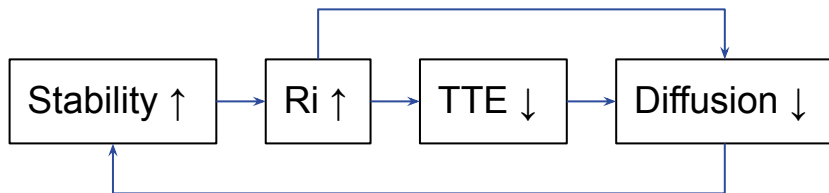
Imbalances in initialization may
cause crashes.

Ex: ERAint initialization for R2B5 at
2000-01-01 00UTC

Temperature @ lev=4, 2000-01-01T09:33:00Z



- 2m temperature is too cold out of the box
 - Stable stratification decouples surface layer from atmosphere above
 - Surface cools rapidly, no downward heat flux
 - Cause: feedback loop



- Fix: Decrease double penalty from Ri number
Reduce suppression of heat flux by stability
- Don't destroy AES tuning: Introduce namelist parameters
`f_theta_limit_fraction = 0.25 ! default 0.0`

- Finish merge
- Towards unified land model
 - ▶ terra performs well in NWP
 - ▶ take best parts of both models
 - ▶ Prerequisite: split terra's 5K lines into process modules
 - ▶ Increase maintainability & extensibility
 - ▶ Plug modules into ICON-Land framework (jsbach's framework)
 - ▶ Add missing processes from jsbach as needed (carbon cycle, phenology, ...)
 - ▶ ...