SoSe 2018

## Exercises "Working with ICON"

## Exercise 6

## Problem 16

Introduce a new "stream" in order to write the emission flux to an output file. To this end, modify the template  $\sim m218036/icon_course_2018/mo_echam_ttr_memory.f90$ .

Inside this module, you find (*i*) the FAD variable echam\_ttr of type t\_echam\_ttr that contains as sole component the 2d-array tracer\_emi for the surface emission flux. You find further (*ii*) the "stream" variable echam\_ttr\_list of type t\_var\_list that will contain all information about the output. The stream has to be connected to the FAD variable by a call to add\_var. Since this has to be done for each model domain, you first allocate your vectors echam\_ttr(n\_dom) and echam\_ttr\_list(n\_dom) in construct\_echam\_ttr\_list. Inside a loop over the model domains, you call new\_echam\_ttr\_list. In new\_echam\_ttr\_list, you first call new\_var\_list and then add\_var. The call to add\_var is:

```
CALL add_var ( echam_ttr_list,'tracer_emi', &
	& echam_ttr%tracer_emi, &
	& GRID_UNSTRUCTURED_CELL, ZA_SURFACE, &
	& cf_desc, grib2_desc, &
	& ldims=shape_2d )
```

For GRIB2 data description, use

```
grib2_desc = grib2_var &
    & ( 0, 14, 3, &
    & DATATYPE_PACK24, GRID_UNSTRUCTURED, &
    & GRID_UNSTRUCTURED_CELL )
```

Call construct\_echam\_ttr\_list in construct\_atmo\_nonhydrostatic of mo\_atmo\_nonhydrostatic.f90 after construct\_psrad\_forcing\_list. Call destruct\_echam\_ttr\_list in mo\_echam\_phy\_cleanup.f90 at the respective place. In mo\_interface\_echam\_ttr.f90 use the FAD echam\_ttr and assign tend%qtrc\_ttr at the appropriate places of interface\_echam\_ttr according to echam\_phy\_config(jg)%fc\_ttr. Perform a short run writing 'tracer\_emi' to a file tracer\_diag using the atm\_amip\_test experiment. What is the difference between the two possibilities of tracer tendency output?