**Max Planck Institute for Meteorology**
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# Exercises
# "Working with ICON"

## Exercise 3
## Problem 10

(*i*) Create a new module `mo_echam_ttr_config` declaring the variables `echam_ttr_name` and `echam_ttr_config`. The latter of type `t_echam_ttr_config` with the following components:

```
USE mo_impl_constants,      ONLY: MAX_CHAR_LENGTH, max_dom
USE mo_kind,                ONLY: wp
...
CHARACTER(LEN=MAX_CHAR_LENGTH):: echam_ttr_name
  TYPE t_echam_ttr_config
    REAL(wp)          :: emi_flux ! emission flux
    REAL(wp)          :: rlat_n   ! northern limit of
       emission
    REAL(wp)          :: rlat_s   ! southern limit of
       emission
  END TYPE t_echam_ttr_config
  TYPE(t_echam_ttr_config), TARGET :: echam_ttr_config(
     max_dom)
```

(*ii*) Create a subroutine `init_echam_ttr_config` in `mo_echam_ttr_config` that sets initial values for the above variables, e.g. `emi_flux=1._wp`, `lat_n=30._wp`, and `lat_s=-30._wp`.

(*iii*) Create a module `mo_echam_ttr_nml`, define the namelist

```
NAMELIST /echam_ttr_nml/ echam_ttr_name, echam_ttr_config
```

in this module and a subroutine `process_echam_ttr_nml` as explained in the lecture.

(*iv*) Write subroutines `eval_echam_ttr_config` and `print_echam_ttr_config` in `mo_echam_ttr_config` that check the admissibility of input values of `echam_ttr_config` and write the actual values at all domains. The latitudes in degrees have to be converted into radiant. Use `deg2rad` from `mo_math_constants` for this purpose.

(*v*) Call `process_echam_ttr_nml` in `mo_read_namelists`, the others in `mo_echam_phy_init`. Test your program also with deliberately wrong input. You need to repeat the configure command to insert the new modules into the respective Makefiles.