COSMO Tools

- In SVN under https://cosmo.cscs.ch/tools/cosmotools/
- Take a look at the README's!
- Contribute you own tools!
  - Possibly of interest for others
  - Minimally documented
- Example: dump / diff_dump presented by Xavier this morning

ij_local2global.pl & ij_global2local.pl

- If you `write(*,*) my_cart_id,i,j` for a certain gridpoint in the COSMO model, you don't know where this gridpoint is on the global domain

```
> ij_local2global.pl
Usage: ij_local2global.pl ie_tot je_tot nboundlines nprocx nprocy
                          my_cart_id i_local j_local
> ij_local2global.pl 520 350 3 20 15 10 25 25
   PE      i      j  i_global  j_global
   10     25     25        25       255
> ij_global2local.pl
Usage: ij_global2local.pl ie_tot je_tot nboundlines nprocx nprocy
                          i_global j_global
> ij_global2local.pl 520 350 3 20 15 25 255
   PE      i      j  i_global  j_global
   10     25     25        25       255
```

YUTIMING utilities

- Process YUTIMING files (average over processors or over forecast hours)

```
> yutiming.pl YUTIMING
                                MIN          AVG          MAX            %
Dyn. Computations            62.020       76.440      157.620        48.99
Fast Waves Comm.              2.820       23.145       63.340        14.83
Fast Waves Barrier            0.000        0.000        0.000         0.00
Communications  Dyn           4.570       19.438       42.740        12.46
Barrier Waiting Dyn           0.000        0.000        0.000         0.00

Phy. Computations            12.730       18.160       27.610        11.64
Communications  Phy           0.170        2.431       11.650         1.56
Barrier Waiting Phy           0.000        0.000        0.000         0.00

...

NOTE: data of 24 simulation hours has been averaged
NOTE: data of 336 CPUs has been averaged
```

cropgrib.sh

- You have a bug and want to reduce the domain size for debugging (using GRIB input)

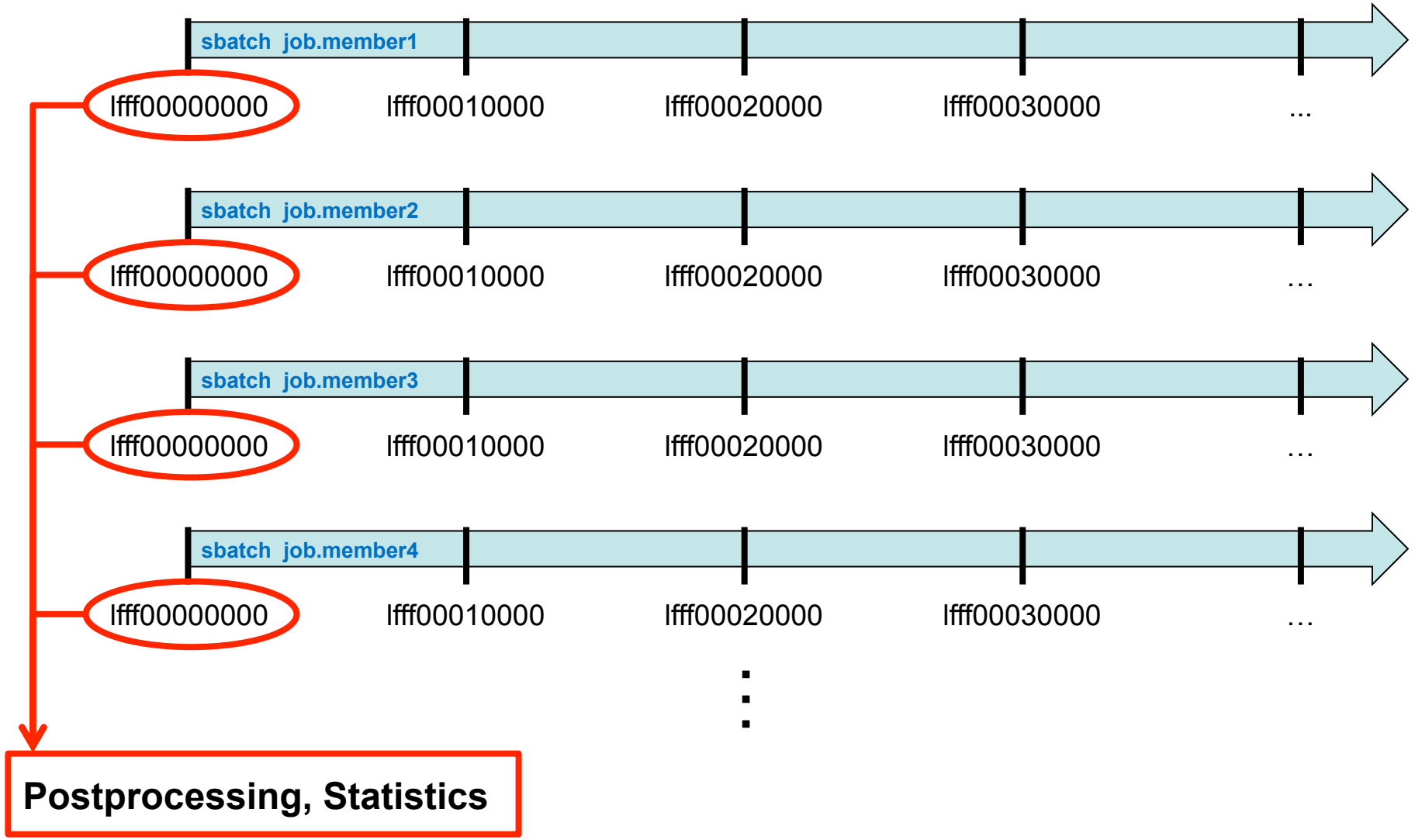
```
> cropgrib.sh input 50 60 100 120
  ...gathering information about grib files
  ...checking size of grib files
  ...checking subdomain
  ...checking grid positions (x-staggered found, y-staggered found)
  ...croping files
  ...copying non-GRIB files
  ...extracting new grid description for INPUT_ORG namelist
&LMGRID
 startlat_tot=-2.820000,  startlon_tot=-4.720000,
 dlon=0.020000,  dlat=0.020000,
 ie_tot=51,  je_tot=61,  ke_tot=60,
 pollat=43.000000,  pollon=-170.000000,
/END
  ...output directory: input.crop
  ...done
```

check_ftn_nl.rb

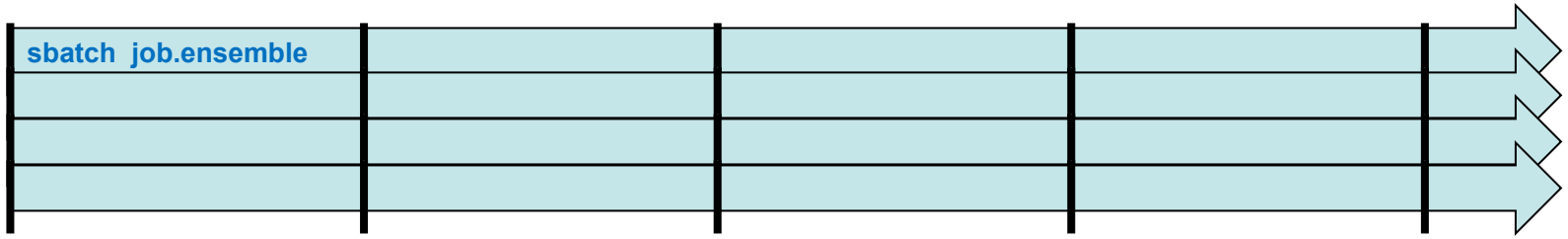
- You have a set of namelists (INPUT_ORG, …) but they don’t match to the model version (or you have a typo!)

```
> check_ftn_nl.rb -s ../../cosmo4.12/src INPUT_*
-------------------------------------------------------------
checking namelist file INPUT_DYN...
-------------------------------------------------------------
namelist 'dynctl' found in src files
-------------------------------------------------------------
checking namelist file INPUT_ORG...
-------------------------------------------------------------
namelist 'lmgrid' found in src files
ERROR: variable 'jje_tot' of namelist 'lmgrid' NOT defined in src files
namelist 'runctl' found in src files
namelist 'tuning' found in src files
...
```

Loose Ensemble Mode



Tight Ensemble Mode



lfff00000000.0001	lfff00010000.0001	lfff00020000.0001	lfff00030000.0001	…
lfff00000000.0002	lfff00010000.0002	lfff00020000.0002	lfff00030000.0002	…
lfff00000000.0003	lfff00010000.0003	lfff00020000.0003	lfff00030000.0003	…
lfff00000000.0004	lfff00010000.0004	lfff00020000.0004	lfff00030000.0004	…

```
&ENSCTL
 lensemble = .true.,      ! activate ensemble mode
 num_members = 4,         ! number of members
 lens_stats = .true.,     ! activate statistics
 ninc_stats = 10,         ! timesteps between
statistics
 lredirect_output = .true.,
/END
```

src_ensemble.f90

- Collection of utilities to **manipulate and evaluate ensemble online** (w/o disk output)

- Compute statistics for a field across ensemble

```
CALL fld_stats('T', t(:,:,:,nnow), options )
```

- Perturb a field (randomly)

```
CALL fld_perturb('T', t(:,:,:,nnow), options )
```

- Synchronize a field across all members

```
CALL fld_synch('T', t(:,:,:,nnow), options )
```