

GEOS-Chem structure

main.f

Read met fields and initial conditions

Time loop: transport timestep

Write output if it's time

Met fields and surface quantities if it's time

Strat. B.C. if asked

Transport if it's time

Non-local PBL: dry deposition and emissions if it's time

PBL and convection if it's time

Old PBL: dry deposition and emissions if it's time

Chemistry if it's time

Wet deposition if it's time

Diagnostics if it's time

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**SMALLEST
timestep !!!!!**

Meaning of “if it's time”

In input.geos (v8-02-02):

```
-----+-----  
%%% CONVECTION MENU %%% :  
Turn on Cloud Conv?    : T  
Turn on PBL Mixing?    : T  
=> Use non-local PBL?  : T  
Convect Timestep (min) : 30
```

Meaning of “if it's time”

In input.geos (v8-02-02):

-----+-----
%%% CONVECTION MENU %%% :
Turn on Cloud Conv? : T **1**
Turn on PBL Mixing? : T
=> Use non-local PBL? : T
Convect Timestep (min) : 30 **4**

For convection, “if it's time” tests:

- if we want the convection in the simulation **1**
- and if it is the good timestep **4**

Meaning of “if it's time”

In input.geos (v8-02-02):

-----+-----
%%% CONVECTION MENU %%% :

Turn on Cloud Conv? : T

Turn on PBL Mixing? : T

=> Use non-local PBL? : T

Convect Timestep (min) : 30

2

3

4

For convection, “if it's time” tests:

- if we want the convection in the simulation
- and if it is the good timestep

For PBL mixing, “if it's time” tests:

• if we want the PBL mixing in the simulation

2

• what type of PBL we want

3

• and if it is the good timestep

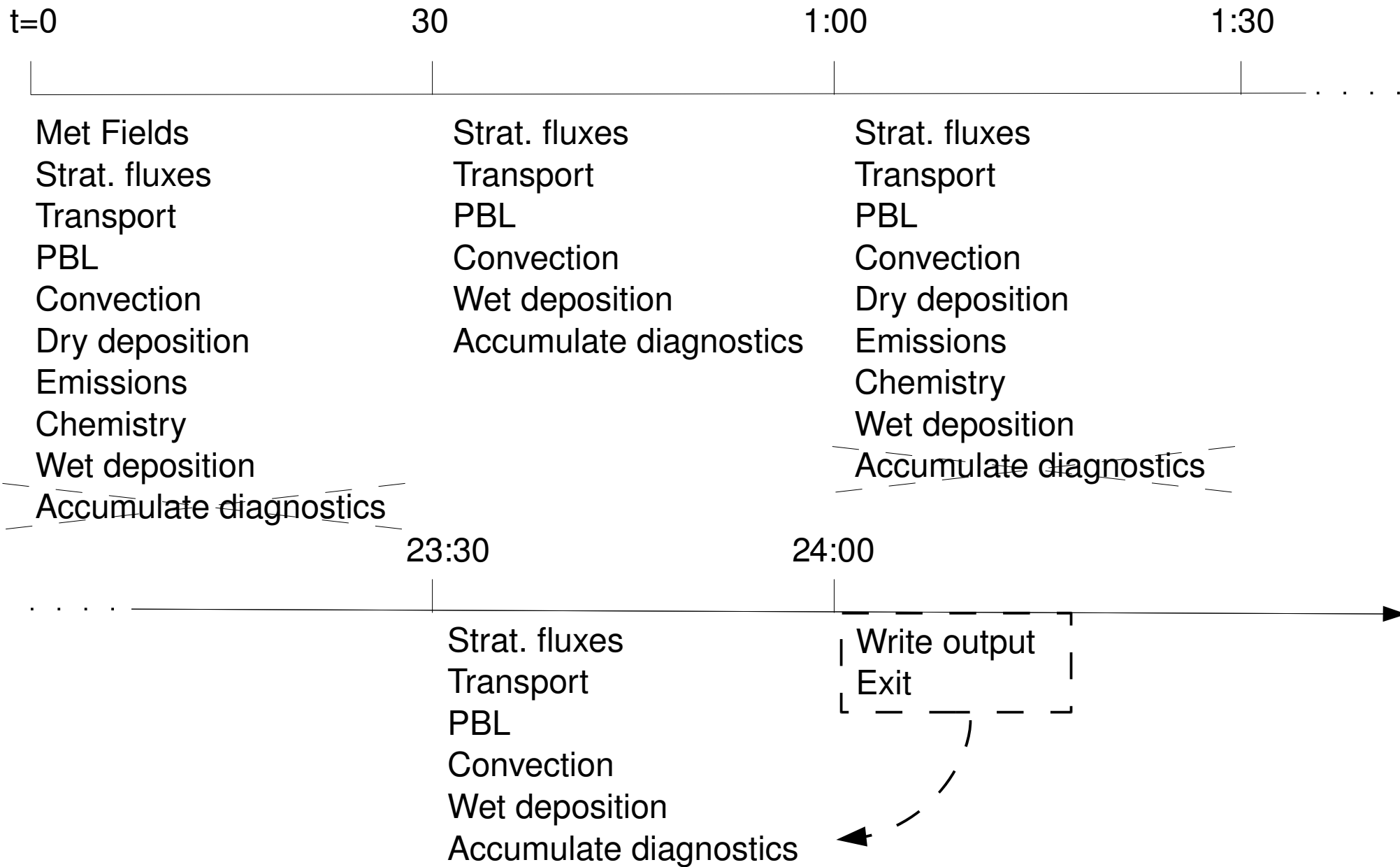
4

Temporal structure of the code

Example for resolution 4x5 with typical values:

Transport, Convection = 30 min

Chemistry, Emission = 60 min.



The structure “philosophy” of each process

transport_mod.f:

do_transport

init_geos5_window_transport
do_geos5_window_transport

init_transport
do_window_transport

init_transport
geos4_geos5_global_adv

init_transport
geos3_global_adv

init_transport
gcap_global_adv

do_pjc_pfix_geos5_window
do_window_tpcore_bc
tpcore_geos5_window

do_window_tpcore_bc
tpcore_window

do_pjc_pfix
tpcore_fvdas

tpcore

do_pjc_pfix
tpcore_fvdas

“Driver” routines

“Active” routines

Unix command: grep

- To know which file does the error message come from.
To know where (and in which file) to put a break point (e.g. TotalView)
To know where a variable is defined and used.
- Grep identifies which files contain a given pattern and gives the file names and the lines where the pattern appears.
- Very simple and common use:

> grep -i 'my pattern' * [| more]

Case insensitive Pattern of interest Search all files in the directory Dispatch one screen of results only. Enter/space to continue

```
> grep -i emisrr * | more
```

```
CMN_O3:! EMISRRN = NOx emissions into sigma levels L=1,NOXEXTENT
```

```
CMN_O3:! EMISRR = All other tracer emissions into sigma level L=1
```

```
CMN_O3: REAL*8 EMISRR, EMISRRN
```

```
CMN_O3: & EMISRR (IIPAR,JJPARG,NEMPARA+NEMPARB),
```

```
CMN_O3: & EMISRRN(IIPAR,JJPARG,NOXEXTENT )
```

```
CMN_O3:! into the EMISRR array for SMVGEAR. (bdf, bmy, 11/1/05)
```

```
acetone_mod.f:! (3 ) OCEAN_SOURCE_ACET : Applies ocean source of acetone to EMISRR
```