

RADIA TO ALADIN

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HIRLAM physics cleaning week
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ILMATIETEEN LAITOS
METEOROLOGISKA INSTITUTET
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SHORT INTRODUCTION

- How to implement HIRLAM's radiation scheme to ALADIN?

HIRLAM physics vs. ALADIN physics

Fortran 77

Fortran 90

Tendencies

Fluxes

Sequential

Parallel



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- How to implement HIRLAM's radiation scheme to ALADIN?

HIRLAM physics

vs.

ALADIN physics

Fortran 77

Fortran 90

Tendencies

Fluxes

Sequential

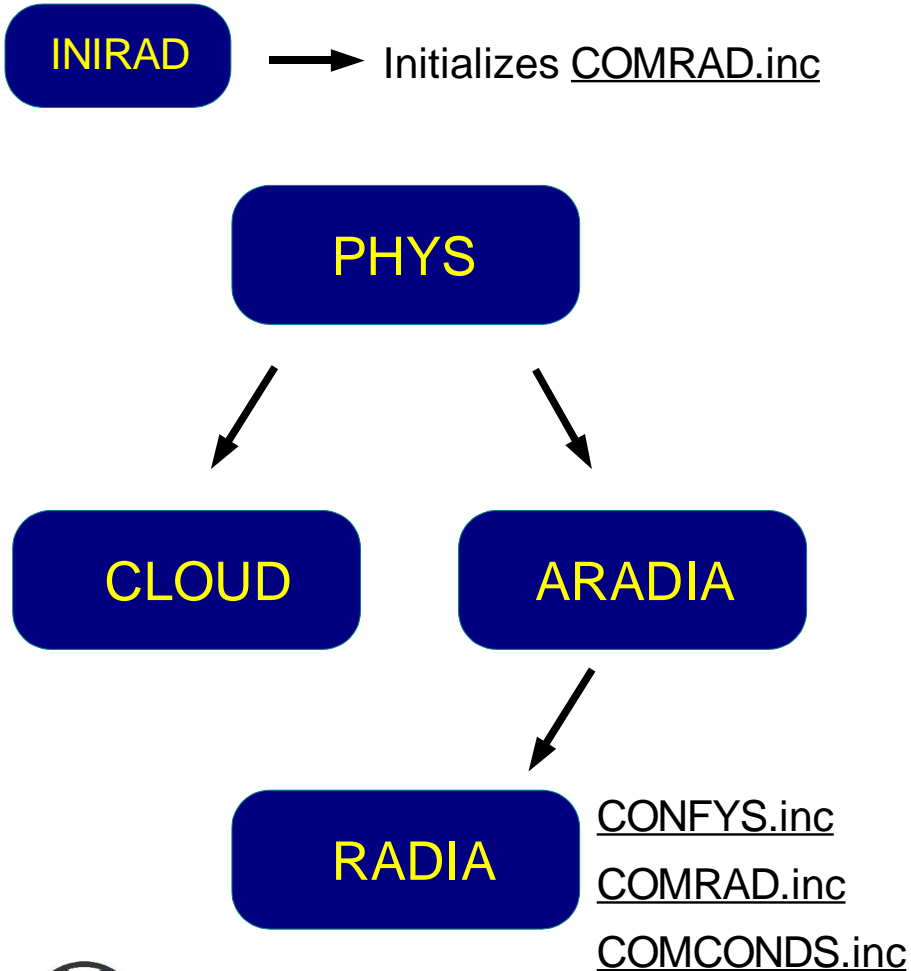
Parallel

- RADIA.f, CLOUD.f, COMRAD.inc
are taken from HIRLAM 6.4.0. (+ eqt correction)



CALL TREES

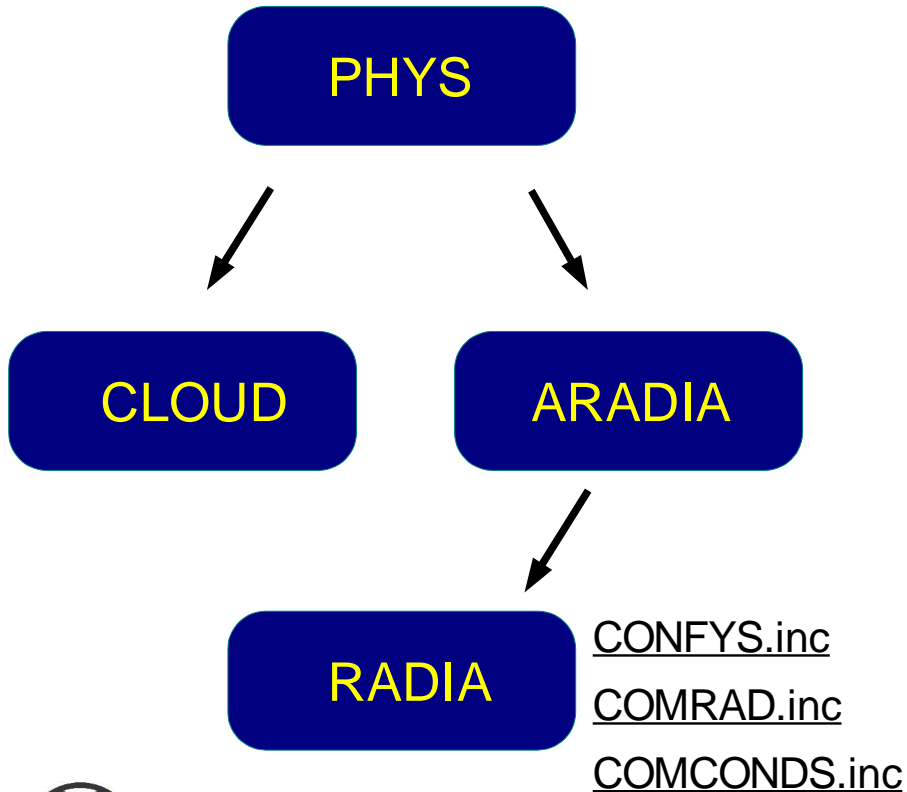
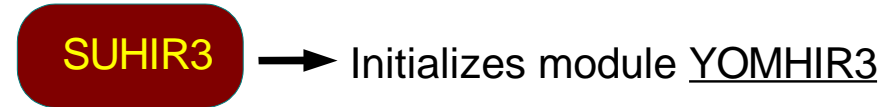
HIRLAM



CALL TREES

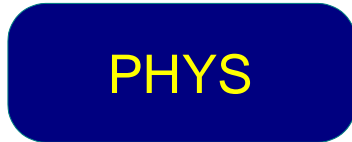
HIRLAM

ALADIN



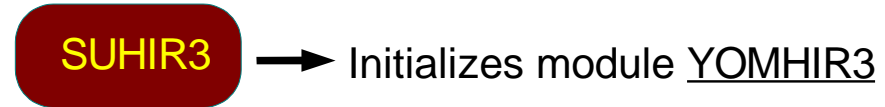
CALL TREES

HIRLAM



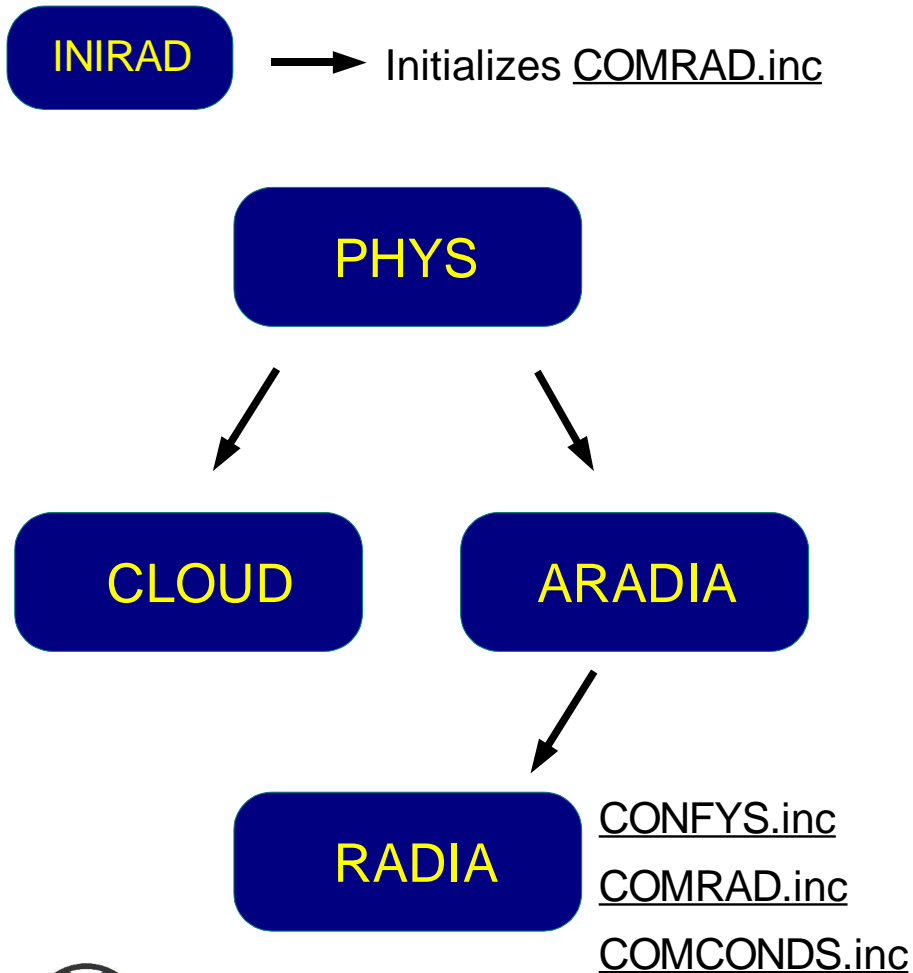
CONFYS.inc
COMRAD.inc
COMCONDS.inc

ALADIN

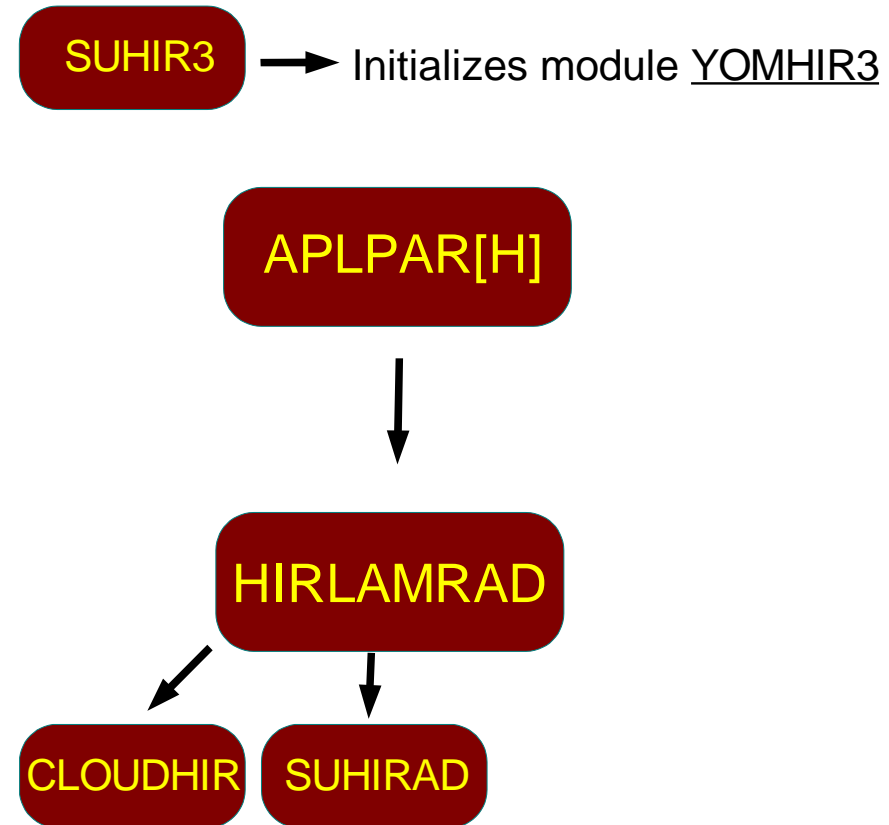


CALL TREES

HIRLAM

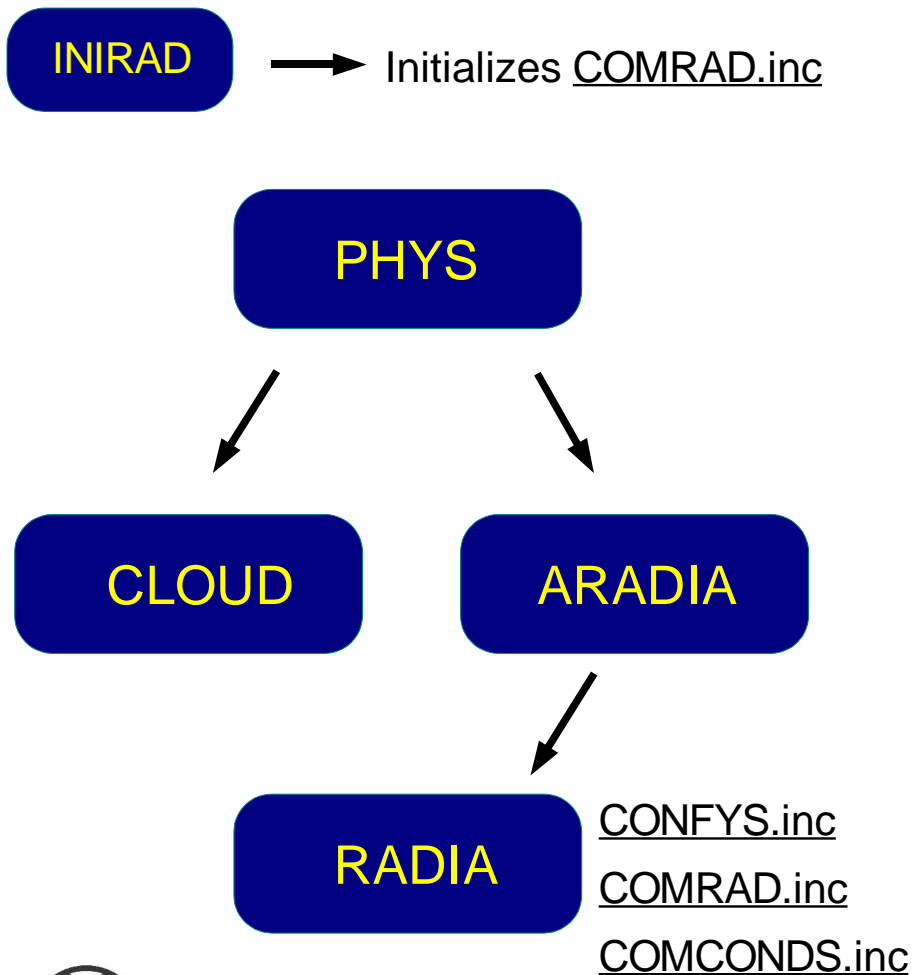


ALADIN

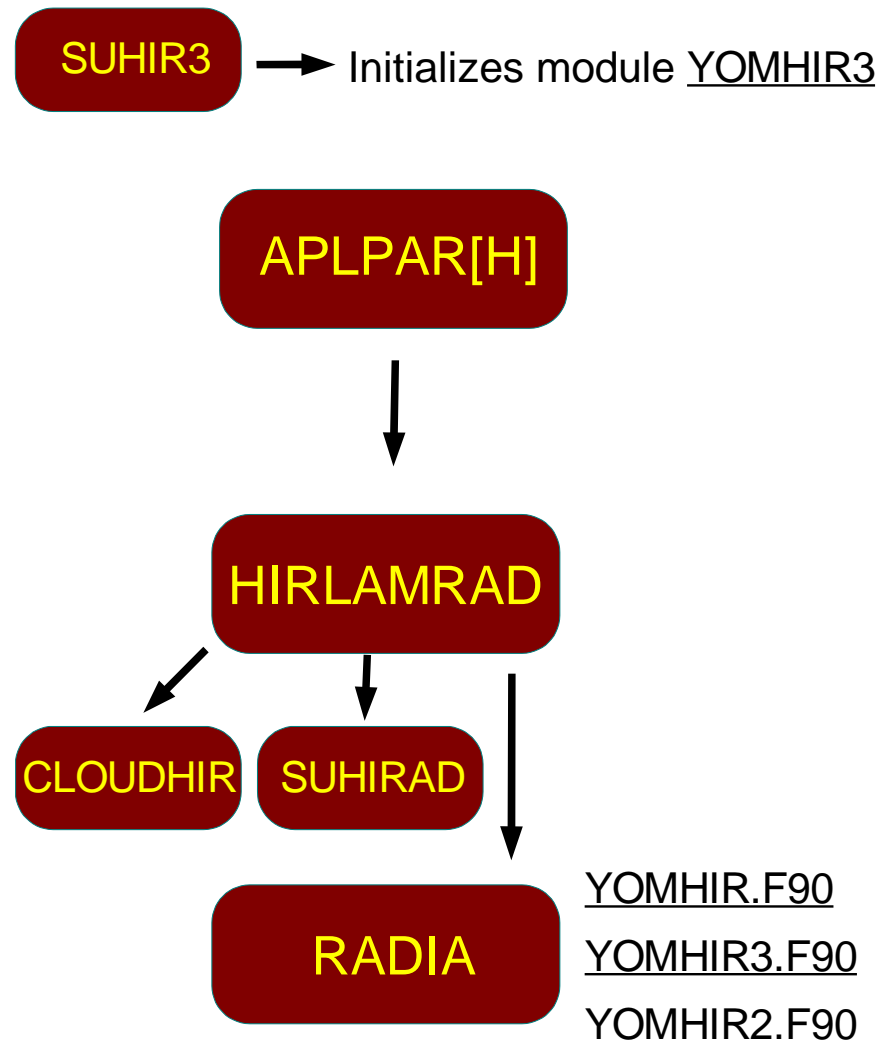


CALL TREES

HIRLAM



ALADIN



MODIFICATIONS - SUMMARY

- **INIRAD** is splitted in two ---> **suhir3.F90** and **suhirad.F90**
- Renaming of **CLOUD.f** ---> **clouahir.F90**



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- **INIRAD** is splitted in two ---> **suhir3.F90** and **suhirad.F90**
- Renaming of **CLOUD.f** ---> **cloudhir.F90**
- Fortran 90 type of coding:

`integer nhor` **→** `INTEGER(KIND=JPIM), INTENT(IN) :: nhor`

`real emc(nlev)` **→** `REAL(KIND=JPRB), ALLOCATABLE :: emc(:)`

`#include "COMRAD.inc"` **→** `USE YOMHIR3`



MODIFICATIONS - SUMMARY

- New logical input parameter `FROMHIR` introduced in `radia.F90` and `suhir3.F90`.

```
FROMHIR=.TRUE.      ! if routine called from HIRLAM
```

```
FROMHIR=.FALSE.    ! if routine called from ALADIN
```

`radia.F90` : zenith angle is calculated inside RADIA
or taken from ALADIN.

`suhir3.F90` : SW radiative flux at TOA and declination angle
are calculated in SUHIR3 (like in HIRLAM)
or taken from ALADIN.



MODIFICATIONS - SUMMARY

- Each variable and constant have a predefined "kind" .

```
USE PARKIND1 , ONLY : JPIM, JPRB
...
INTEGER(KIND=JPIM), INTENT(IN)      :: nlev
REAL(KIND=JPRB), INTENT(IN)        :: hybf(nlev)
...
zeps=0.001_JPRB
```



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...
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```

- DR HOOK debugging module added.

```
USE YOMHOOK , ONLY : LHOOK, DR_HOOK
...
! At the beginning
IF (LHOOK) CALL DR_HOOK('RADIA',0,ZHOOK_HANDLE)
...
! At the end
IF (LHOOK) CALL DR_HOOK('RADIA',1,ZHOOK_HANDLE)
```



radia.F90 back to HIRLAM?

- Not tried... yet!
- How to do it?

- 1) Introduce module PARKIND1 to HIRLAM.
- 2) Introduce module YOMHOOK to HIRLAM.

How to mix common-blocks and modules safely?
(e.g. **CONFYS.inc** vs. **yomhir.F90**)

