

The current call of PHYS is:

```

SUBROUTINE PHYS ( KSTEP, NHOR, NLEV, NTYPE, KSTART, KSTOP,
+   YEARC, MONTHC, DAYC, HOURC, MINC, SECC,
+   DTIME, NSVDIF, CONACC,
+   DTHETA,
+   LSTAT, NLSTPH2D, LSAMEDT, LNEWPH, LDYNVD,
+   KOPTION,
+   T, Q, CW, U, V, OMF,
+   PS,
+   ALONG, COSLAT, SINLAT, TSDCLI, SWDCLI,
+   Z0ORO, Z0SEA, Z0HEAT, Z0VEG,
+   ALBEDO,
+   PRCPST, PRCPCU, CUSNOW, STSNOW,
+   ACCEV, ACCRUNOFF,
+   DRAINDT, DSNOWDT,
+   TSI, TSDI, SWI, SWDI, SNI, CANI, FRACI, SOILI, VEGI,
+   SII, SIDI,
+   DTSI, DTSDI, DSWI,
+   DSWDI, DSNII, DCANI,
+   DSII, DSIDI,
+   T2MI, Q2MI, U10MI, V10MI,
+   QSI,
+   SENFI, LATFI, MOMFI,
+   SENF, LATF, MOMFU, MOMFV,
+   DPSDIN,
+   COV2D, CWPATH,
+   CLDHIG, CLDMED, CLDLow, CLDFOG, CLDBAS, CLDTP,
+   PBLH,
+   AHYB, BHYB, HYBF, HYBH,
+   EMC, CSUSA, FABSO3, CADD, C1ER, CML2,
+   STDIF, STDDIF, STCON, STDCON, STRAD, STRAD, STCLO, STDCLO,
+   STCOV, STDCOV, STCCOV, STSCOV, STCW, STCPNT, STTPNT, STSCAL,
+   DTD, DQDT, DCWDT, DUDT, DVDT,
+   TOTCOV, CUCOV,
+   DTDTPH, DQDTPH, DCDTPH, DUDTPH, DVDTPH,
+   SVAR, DSVARDT, NSVAR,
+   PRETA, DTP, DTPR, DTPT, DQP, DQPT, DCP, DCPT,
+   DUP, DUPT, DVP, DVPT,
+   SLWNET, SSWNET, SLWDN, SSWDN, TLWNET, TSWNET, TSWDN,
+   SALB,
+   DTDTCO, DQDTCO, DCWDTCO
+ )
```

which is pretty unreadable. This call contains several climate fields, such as Z0ORO, Z0SEA, Z0HEAT, and Z0VEG. Purpose is to combine these fields into a single array, called TOPO, replacing many of the arguments. The files that we intend to combine are the ones that are stored in the climate file, but might also contain other fields.

The definition of TOPO is:

```
real TOPO (NHOR, NFLD)
```

where NFLD is the number of fields.

e.g. leaf area index can be stored as TOPO (: , IXLAI)

If there are different values per tile then we can store the fields as TOPO (: , IXLAI + 1) and TOPO (: , IXLAI + 2),

The argument in a function call requiring leaf area index will be:

```
func ( . . . , TOPO ( 1 , IXLAI ) , . . . ) instead of
func ( . . . , LAI , . . . )
```

but if there are more fields that are passed to func, then it is easier to write:

```
func ( . . . , TOPO , . . . ) instead of (for example)
func ( . . . , CANI , FRACI , SOILI , VEGI , . . . )
```

Differentiating between `CANI` , `FRACI` , `SOILLI` , `VEGI` is done within `func`.

The definitions of the indices `IXLAI`, etc. are defined in a single include file, which must be included in all functions that need `TOPO` .

The advantages of this approach are:

- The number of function arguments is reduced significantly, which improves readability; and
- Adding new fields, such as vegetation index is realised basically by modifying the include file. We don't have to trace which functions pass the new fields as arguments. As the indices are virtual it is not needed to keep track of the numbering as long as we use these names. E.g. `IXLAI` could be defined as 1 in the first version, but 5 in the second one without any notice.

The provisional modifications are implemented in the latest reference version 6.3.5.