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## Operator CHAINAGE\_THM

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### 1 Drank

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Compute the command variables for the resolution by sequence in THM.

This command creates the fields necessary to be able to carry out the resolution by a method by sequence, different from the traditional method by strong coupling of the equations (cf "Note of use of modulus THM" [U2.04.05] for more details on the resolution of problems THM). This method applies more particularly to the slightly coupled problems.

This command is used in 2 meanings:

- mechanics towards the hydraulics: product a structure of the `evol_varc` type. From the field of mechanical displacements known on the mechanical mesh, one from of deduced the nodal voluminal strain at the 2 last moments from result mechanical. One projects then this nodal voluminal strain on the hydraulic mesh.
- hydraulics towards the mechanics: starting from the field of pressure known on the hydraulic mesh, one projects this field of pressure on the mechanical mesh.
  - product a structure of the `cham_no` type, if mechanical computation is carried out with `MECA_STATIQUE`
  - produced a structure of the `evol_varc` type, if mechanical computation is carried out with `STAT_NON_LINE`

Beforehand, the user must have calculated the matrixes of projection allowing to save time in the phases of projection between the meshes mechanics and hydraulics.

## 2 Syntax

```
chproj [evol_varc, cham_no] = CHAINAGE_THM (
  ◆TYPE_CHAINAGE=/
[TXM]
                                "HYDR_MECA",
                                / "MECA_HYDR",
                                / "INIT",

# If TYPE_CHAINAGE=' INIT'

◆MODELE_MECA=                " models mechanical"                / [model]
◆MODELE_HYDR=                " models hydraulic"                / [model]
◆MATR_MH=                    " stamps projection for the mechanical meaning towards hydraulics",
[corresp_2_mailla]
◆MATR_HM1=                    " 1st matrix of projection for the hydraulic meaning towards mechanics",
[corresp_2_mailla]
◆MATR_HM2=                    " 2nd matrix of projection for the hydraulic meaning towards mechanics",
[corresp_2_mailla]

# If TYPE_CHAINAGE=' MECA_HYDR'

◆ RESU_MECA=                  " result of mechanical computation to be chained towards the hydraulics"
                                                                    / [evol_elas]
                                                                    / [evol_noli]

model      ◆MODELE_HYDR= " of hydraulic arrival"
                                                                    / [model]

◆MATR_MH=matproj            ,
                                                                    [corresp_2_mailla]

◆INST=inst                  ,
                                                                    [R]

# If TYPE_CHAINAGE=' HYDR_MECA'

◆ RESU_HYDR=                " result of hydraulic computation to chain towards the mechanics"
                                                                    / [evol_noli]

◆MODELE_MECA=                " models of mechanical arrival"
                                                                    / [model]

◆MATR_HM1=                    " 1st matrix of projection",
[corresp_2_mailla]
◆MATR_HM2=                    " 2nd matrix of projection",
[corresp_2_mailla]

◆TYPE_RESU=/
                                "EVOL_VARC",
                                                                    [TXM]
                                / "CHAM_NO",
◇INST=inst                    , (compulsory if TYPE_RESU=' EVOL_VARC')
                                                                    [R]

◇INFO      =/1
                                /2 ,
                                                                    [DEFAULT]
)
)
```

## 3 Operands

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### 3.1 Operand TYPE\_CHAINAGE

```
◆TYPE_CHAINAGE=/          "INIT",  
                          /  "HYDR_MECA",  
                          /  "MECA_HYDR",
```

the first operation to be made in the frame of sequence THM is to calculate the matrixes of projection to save time on the many projections carried out inside the macro-command. This operation is done by "INIT" . The user must then give the models mechanics and hydraulics used by keywords MODELE\_MECA and MODELE\_HYDR . In output 3 matrixes are produced, under keywords MATR\_MH (for the mechanical meaning towards hydraulic) , MATR\_HM1 and MATR\_HM2 (for the hydraulic meaning towards mechanics) .

Then, it can pass to the phase of sequence itself. There are thus two meanings of transition: mechanics towards the hydraulics or of the hydraulics towards the mechanics.

If RESU\_HYDR is informed, TYPE\_CHAINAGE=' HYDR\_MECA' will be chosen.  
If RESU\_MECA is informed, TYPE\_CHAINAGE=' MECA\_HYDR' will be chosen.

### 3.2 Operand RESU\_MECA

```
◆ RESU_MECA=resu
```

Name of result mechanical which one seeks to chain.

### 3.3 Operand RESU\_HYDR

```
◆ RESU_HYDR=resu
```

Name of result hydraulic which one seeks to chain.

### 3.4 Operand MODELE\_MECA

```
◆ MODELE_MECA=resu
```

Name of the mechanical model of arrival.

### 3.5 Operand MODELE\_HYDR

```
◆ MODELE_HYDR=resu
```

Name of the hydraulic model of arrival.

### 3.6 Operand TYPE\_RESU

```
◆TYPE_RESU=/          "EVOL_VARC",  
                    /  "CHAM_NO",
```

Standard of result returned by the command. Compulsory if TYPE\_CHAINAGE=' HYDR\_MECA' or "MECA\_HYDR"

the user will always choose EVOL\_VARC, except in case TYPE\_CHAINAGE=' HYDR\_MECA', with a mechanical resolution carried out then by MECA\_STATIQUE.

## 3.7 Operand INST

◇ INST = inst

Urgent to which one wishes to calculate sequence the command variable. Compulsory in all the cases, except if `TYPE_CHAINAGE=' HYDR_MECA '`, with a mechanical resolution carried out then by `MECA_STATIQUE`.

## 3.8 Operand MATR\_MH

◆ MATR\_MH=matproj

This keyword is used for the mechanical meaning towards hydraulics.

This keyword is useful to save time on the phases of projection. `matproj` must be beforehand calculated. That prevents recomputing the data structure `corresp_2_mailla` between the meshes mechanics and hydraulics if those remain constant in the course of time (what is in practice often the case, apart from the case of the adaptive meshes).

The concept is produced in the case of `TYPE_CHAINAGE=' INIT '`, then re-used like concept of entry in case `TYPE_CHAINAGE=' MECA_HYDR '`.

## 3.9 Operands MATR\_HM1 and MATR\_HM2

◆MATR\_HM1=matproj1

◆MATR\_HM2=matproj2

keywords `MATR_HM1` and `MATR_HM2` function of `par`.

These keywords are useful to save time on the phases of projection. `Matproj1` and `matproj2` must be calculated beforehand. That prevents recomputing the SD `corresp_2_mailla` between the meshes hydraulics and mechanics if those remain constant in the course of time (what is in practice often the case, apart from the case of the adaptive meshes).

The concepts are produced in the case of `TYPE_CHAINAGE=' INIT '`, then re-used like concepts of entry in case `TYPE_CHAINAGE=' MECA_HYDR '`.

## 3.10 Operand INFO

◇INFO =/1 ,  
/2 ,

Parameter of printing