

## Operator LIRE\_FONCTION

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### 1 Drank

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Lira a data file containing of the actual values representing a function. Product a concept of type `function [U4.31.02]` or `three-dimensions function [U4.31.03]`.

## 2 Syntax

```
F [function] =LIRE_FONCTION (
    ◆ UNITE= U , [I]
    ◇FORMAT= "LIBRE", [DEFAULT]
    ◇SEPAR = / "Nun", [DEFAULT]
              / ", ",
              / "; ",
              / "/ ",
    ◆NOM_PARA = cf key word are equivalent of DEFI_FONCTION
[U4.31.02],
    ◇NOM_RESU = cf equivalent key word of DEFI_FONCTION [U4.31.02],
    ◇INTERPOL =idem
    ◇PROL_DROITE =idem
    ◇PROL_GAUCHE = idem
    ◇VERIF = idem
    ◇TITER = idem
    ◇INFO = idem
    ◇INDIC_PARA = / [1,1], [DEFAULT]
                  / [indice1, indice2]
    ◇TYPE = / "FONCTION", [DEFAULT]
            / "FONCTION_C",
            / "THREE-DIMENSIONS FUNCTION",
    if TYPE=' FONCTION':
    ◇INDIC_RESU = / [1,2], [DEFAULT]
                  / [indice1, indice2]
    if TYPE=' FONCTION_C':
    ◇FORMAT_C = / "REEL_IMAG" [DEFAULT]
                / "MODULE_PHASE",
    if FORMAT_C=' REEL_IMAG':
    ◆INDIC_REEL = / [1,2], [DEFAULT]
    ◆INDIC_IMAG = / [1,3], [DEFAULT]
    if FORMAT_C=' MODULE_PHASE':
    ◆INDIC_MODU = / [1,2], [DEFAULT]
    ◆INDIC_PHAS = / [1,3], [DEFAULT]
    if TYPE=' NAPPE':
    ◆NOM_PARA_FONC= cf key word NOM_PARA
    ◆INDIC_ABSCISSE= [indice1, indice2], [l_I]
    ◇INTERPOL_FONC=cf key word INTERPOL
    ◇PROL_DROITE_FONC=cf key word PROL_DROITE
    ◇PROL_GAUCHE_FONC= cf key word PROL_GAUCHE
    ◇DEFI_FONCTION= _F (
        ◆INDIC_RESU= [indice1, indice2], [l_I]
    )
)
```

## 3 Operands

### 3.1 Operand UNITE

◆UNITE = U

Whole, logical number of the unit of reading, defining the file in which the data are read.

### 3.2 Operand FORMAT

◇FORMAT = "LIBRE",

This key word is for the moment useless. It will be able in the future to make it possible to define a format of specific reading, more constraining than the current format.

### 3.3 Operand SEPAR

◇ SEPAR = 'None' or ", " or "; " or "/"

separating Character of the columns of figures in the file with reading.

The value by default "Nun" means one or more white spaces. For the other separators, white spaces are tolerated between the figures and the separator itself.

### 3.4 Operands PROL\_DROITE / PROL\_GAUCHE/NOM\_PARA/NOM\_RESU/INTERPOL/VERIF/TITER/INF O

the numerical values are read in the file indicated, then the function is actually created by LIRE\_FONCTION by calling DEFI\_FONCTION or DEFI\_NAPPE.

Thus, these key keys are taken again with identical DEFI\_FONCTION or DEFI\_NAPPE and make it possible to specify the characteristics of the produced function: interpolation, prolongations, names of the parameters of access.

### 3.5 Operand INDIC\_PARA

◇INDIC\_PARA = / [indice1, indice2]

This key word is identical in its principle to key word VALE\_PARA of the command DEFI\_FONCTION. It makes it possible to choose the column of figures in the file read which will define the X-coordinates of the function, are the values of the parameter.

One expects obligatorily a list of two integers: the first indicating the number of "block" in the file (cf paragraph [§4] Examples), the second indicating the number of the column. To identify the blocks of the file, one line regards as separator of blocks all which would not exclusively contain figures and separators of columns. The columns are defined by the presence of separators of columns delimiting them (key word SEPAR).

The value by default is [1,1]: the first column of the first block is read. That makes it possible to define very easily, by informing less possible keywords, the reading of a function in a file containing two simple columns of figures.

### 3.6 Operand TYPE

◇TYPE = / "FONCTION", [DEFAULT]  
/ "FONCTION\_C",  
/ "THREE-DIMENSIONS FUNCTION",

the type of function read and created Specifies: "FONCTION", "FONCTION\_C" (call in the macro - command with DEFI\_FONCTION) or "THREE-DIMENSIONS FUNCTION" (call to DEFI\_NAPPE).

## 3.7 Case of a real function: TYPE=' FONCTION '

◇INDIC\_RESU = / [indice1, indice2]

Of operation identical to INDIC\_PARA, this key word makes it possible to choose the column of figure in the file read defining the Y-coordinates of the function, are the values of result.

The value by default is [1,2]: the second column of the first block is read.

## 3.8 Case of a complex function: TYPE=' FONCTION\_C '

◇FORMAT\_C= "REEL\_IMAG"  
◆INDIC\_REEL = / [indice1, indice2]  
◆INDIC\_IMAG = / [indice1, indice2]

◇FORMAT\_C= "MODULE\_PHASE"  
◆INDIC\_MODU = / [indice1, indice2]  
◆INDIC\_PHAS = / [indice1, indice2]

In the case of a complex function, two columns of figures (actual values) are to be identified in the file read to define the list of the complex values of result. One can thus read with the imaginary choice left real/left or modulates/phase. The phase is expressed in radian.

The values by default are respectively [1,2] and [1,3]: the second and third columns of the first block are read. The first column read by default having been the value of parameter (INDIC\_PARA).

## 3.9 Case of a three-dimensions function: TYPE=' NAPPE '

◆NOM\_PARA\_FONC= cf key word NOM\_PARA  
◆INDIC\_ABSCISSE= [indice1, indice2],  
◇INTERPOL\_FONC=cf key word INTERPOL  
◇PROL\_DROITE\_FONC=cf key word PROL\_DROITE  
◇PROL\_GAUCHE\_FONC= cf key word PROL\_GAUCHE  
◇DEFI\_FONCTION= \_F (  
◆ INDIC\_RESU= [indice1, indice2],

the principle is the same one as that of DEFI\_NAPPE [U4.31.03]: the list of possible values of the parameter (second variable) having been defined by INDIC\_PARA, it remains to identify the functions in the file read by the key word factor DEFI\_FONCTION (similar to the key word factor FONCTION of DEFI\_NAPPE). Attention, the number of identified functions (occurrences of the key word factor) will have to be identical to the cardinal of the values read by INDIC\_PARA.

Contrary to the three-dimensions functions in general, one imposes that the functions divide the same list of values of X-coordinates INDIC\_ABSCISSE, this is why only INDIC\_RESU is present under the key word factor DEFI\_FONCTION.

Key words "\_FONC" apply to the functions of the three-dimensions function (cf DEFI\_NAPPE, factor key word DEFI\_FONCTION [U4.31.03]).

## 4 Examples of use

Is the textual file following containing information to reading. It is composed of columns of figures, here separated by white spaces, defining blocks, themselves delimited by free text.

All line including of other characters that figures and the preset separator is regarded as free text delimiting. There are thus 4 blocks in the following file:

```
aaa bbb ccc
ddd
eee FF
0.      0.      0.
0.1     1.      10.
0.2     2.      20.
0.3     3.      30.
xxx yyy
www zzz
0.4     4.      40.    400.
0.5     5.      50.    500.
0.6     6.      60.    600.
xxx
70.     700.
80.     800.
90.     900.
PPP qqq
8.8.9.9
```

### 4.1 Reading of a simple function

By exploiting the values by default for the choice of the columns:

```
F=LIRE_FONCTION ( UNITE = 38,
                  NOM_PARA = "INST", )
```

the function thus created is:

```
Abscisses= [0. , 0.1,0.2,0.3]
Ordonnées= [0. , 1. , 2. , 3. ]
```

While associating for X-coordinates and Y-coordinates of the columns taken in different blocks:

```
F=LIRE_FONCTION ( UNITE = 38,
                  NOM_PARA = "INST",
                  INDIC_PARA = [2,4],
                  INDIC_RESU = [3,1],
```

the function thus created is:

```
Abscisses= [400. , 500. , 600.]
Ordonnées= [ 70. , 80. , 90.]
```

Attention, the command checks whereas the cardinals of the columns defined by `INDIC_PARA` and `INDIC_RESU` are quite identical. What would not have been the case here with for example `INDIC_PARA = [1,3]`.

## 4.2 Reading of a function complexes

By exploiting the values by default for the choice of the columns:

```
F=LIRE_FONCTION ( UNITE=      38,  
                  NOM_PARA=   "INST",  
                  TYPE=       "FONCTION_C",  
                  FORMAT_C=   "REEL_IMAG", )
```

the function thus created is:

Abscisses= [0. , 0.1,0.2,0.3]  
Ordonnées= [(0. , 0.), (1. , 10.), (2. , 20.), (3. , 30.)]

One of course could have specified other columns for INDIC\_REEL and INDIC\_IMAG that those by default. Attention however to point on columns in the same way cardinal.

## 4.3 Reading of a three-dimensions function

By exploiting the values by default for the choice of the columns:

```
F=LIRE_FONCTION ( UNITE=      38,  
                  NOM_PARA=   "INST",  
                  INDIC_PARA= [4,1],  
                  NOM_PARA_FONC= "FREQ",  
                  INDIC_ABSCISSE= [2,2],  
                  DEFI_FONCTION= ( F ( INDIC_RESU = [3,1], ),  
                                   F ( INDIC_RESU = [2,3], ), ) )
```

the three-dimensions function thus created is:

For the value of parameter INST=8.8, the function:

Abscisses= [4. , 5. , 6.]  
Ordonnées= [70. , 80. , 90.]

For the value of parameter INST=9.9, the function:

Abscisses= [4. , 5. , 6.]  
Ordonnées= [40. , 50. , the 60.]

checks of coherence of the cardinals of columns of X-coordinates and Y-coordinates are made by the command.