

## Data format sd\_interspectre

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### Summarized:

The data structure `sd_interspectre` contains the components of an interspectral matrix. Each term of this matrix is a function which depends on the frequency. This function is real if it is about an autospectrum (diagonal term of the matrix), it is complex if it is about an interspectrum (extra-diagonal term).

That data structure is used by the following operators: `CALC_INTE_SPEC`, `DYNA_ALEA_MODAL`, `PROJ_SPEC_BASE`, `REST_SPEC_PHYS`, `DEFI_SPEC_TURB`, `DYNA_SPEC_MODAL`, `GENE_FONC_ALEA`, `POST_DYNA_ALEA`, `CALC_ESSAI`, `CALC_SPEC`, `DEFI_INTE_SPEC`, `DYNA_ISS_VARI` and `LIRE_INTE_SPEC`.

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## 1 General information

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an interspectral matrix are a hermitian matrix. The data structure `sd_interspectre` contains the components of this interspectral matrix. Each term of this matrix is a function which depends on the frequency.

Each term of the matrix is localised either by a sequence number, or by the couple (node, component). One can store only the diagonal terms or the higher triangular part of the matrix. The diagonal terms of the matrix are pure realities and the extradiagonaux terms are complexes.

That data structure is used by the following operators: `CALC_INTE_SPEC` , `DYNA_ALEA_MODAL` , `PROJ_SPEC_BASE` , `REST_SPEC_PHYS` , `DEFI_SPEC_TURB` , `DYNA_SPEC_MODAL` , `GENE_FONC_ALEA` , `POST_DYNA_ALEA` , `CALC_ESSAI` , `CALC_SPEC` , `DEFI_INTE_SPEC` , `DYNA_ISS_VARI` and `LIRE_INTE_SPEC` .

## 2 Tree structure of Data format

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```
the sd_interspectre (K8):: = record
    ◆ ' .REFE '      : OJBSVK16
    ◆ ' .FREQ '      : OJBSVR
    ◇ ' .NUMI '      : OJBSVI
    ◇ ' .NUMJ '      : OJBSVI
    ◇ ' .NOEI '      : OJBSVK8
    ◇ ' .CMPI '      : OJBSVK8
    ◇ ".NOEJ"        : OJBSVK8
    ◇ ' .CMPJ '      : OJBSVK8
    ◆ ' .VALE '      : OJBXDVRNU
```

## 3 Contained of the objects

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### 3.1 Object .REFE

```
".REFE"      : OJBSVK16long          = 2
REFE (1) : name of field
REFE (2) : option of computation
```

### 3.2 Object .FREQ

```
".FREQ"      : OJBSVRlong          = nbfreq
```

This object contains the list of the frequencies where the spectrums are defined.

### 3.3 Object .NUMI

```
".NUMI"      : OJBSVIlong          = nbspec
```

`NUMI (K)` contains the sequence number associated at line with the interspectral matrix whose spectrum is in `VALE (K)` .

### 3.4 Object .NUMJ

*Warning : The translation process used on this website is a "Machine Translation". It may be imprecise and inaccurate in whole or in part and is provided as a convenience.*

".NUMJ" : OJBSVIlong = nbspec

NUMJ (K) contains the sequence number associated with the column with the interspectral matrix whose spectrum is in VALE (K).

### 3.5 Object .NOEI

".NOEI" : OJBVK8long = nbspec

NOEI (K) contains the name of the node associated at line with the interspectral matrix whose spectrum is in VALE (K).

### 3.6 Object .CMPI

".CMPI" : OJBVK8long = nbspec

CMPI (K) contains the name of the component associated at line with the interspectral matrix whose spectrum is in VALE (K).

### 3.7 Object .NOEJ

".NOEJ" : OJBVK8long = nbspec

NOEJ (K) contains the name of the node associated with the column with the interspectral matrix whose spectrum is in VALE (K).

### 3.8 Object .CMPJ

".CMPJ" : OJBVK8long = nbspec

CMPJ (K) contains the name of the component associated with the column with the interspectral matrix whose spectrum is in VALE (K).

### 3.9 Object .VALE

".VALE" : OJBXDVRNU

This collection contains `nbspec` objects. Each object is located by the number of line and the number of the column in the matrix. This issue of line or column is defined either by a sequence number, or by the couple (node, component).

If the number of line or the column of the matrix is described by one sequence number:  
VALE (K) contains the spectrum at line corresponding associated with NUMI (K) and the column associated with NUMJ (K).

If the issue of line or of the column is described by the couple (node, component):  
VALE (K) contains the spectrum at line corresponding associated with (NOEI (K), CMPI (K)) and with the column associated with (NOEJ (K), CMPJ (K)).

The size of the diagonal terms of this matrix is equal to `nbfreq`. The autospectrums are arranged according to list `FREQ`.

The size of the extra-diagonal terms of this matrix is equal to  $2 * nbfreq$ . The interspectrums are arranged partly real – imaginary part according to list `FREQ`.

