
Operator REST_SPEC_TEMP

1 of results

Drank Return of fields, in generalized coordinates or in physical base, from frequential towards the temporal one and conversely by fast transform of Fourier (FFT).

This operator allows, from result transitory evolution on a system in generalized coordinates or in physical base, to obtain result frequential evolution on the same basis by direct transformation of Fourier of each transitory function of evolutions in each point and each component of the selected kinematical fields (displacements, velocities or accelerations). And reciprocally, from result from frequential evolution on a system in generalized coordinates or in physical base, one obtains result transitory evolution on the same basis by opposite transformation of Fourier of each harmonic function of evolutions in each point and each component of the selected kinematical fields.

For each transformed evolution, the operation is similar to that produced by the call to operator CALC_FONCTION with key word FFT.

The product concept is a concept of the type:

- `dyna_trans` if result of departure transformed by FFT is of `dyna_harmo` type,
- `dyna_harmo` if result of departure transformed by FFT is of `dyna_trans` type,
- `tran_gene` if result of departure transformed by FFT is of `harm_gene` type,
- `harm_gene` if result of departure transformed by FFT is of `tran_gene` type.

2 Syntax

```
resphy = REST_SPEC_TEMP                                [*]
(
  ♦ / RESULTAT = resu,                                / [dyna_trans]
  / RESU_GENE = tg,                                   / [dyna_harmo]
  / [tran_gene]
  / [harm_gene]
  ♦ / TOUT_CHAM = "OUI",
  ♦ / NOM_CHAM = | "DEPL",
  | "QUICKLY",
  | "ACCE",
  ♦ SYMETRIE = / "OUI",                                [DEFAULT]
  / "NON",
  ♦ METHODE = / "PROL_ZERO",                            [DEFAULT]
  / "TRONCATURE",
)
```

If RESU_GENE of the tran_gene type then [*] = harm_gene

If RESU_GENE of the harm_gene type then [*] = tran_gene

If RESULTAT of the dyna_trans type then [*] = dyna_harmo

If RESULTAT of the dyna_harmo type then [*] = dyna_trans

3 Operands

3.1 Operands RESU_GENE /RESULTAT

◆ / RESU_GENE = tg

This key word can be used if the concept to be transformed by FFT direct or opposite is result a transitory evolution in generalized coordinates of tran_gene type or frequential of harm_gene type.

/ RESULTAT = resu

This key word can be used if the concept to be transformed by FFT direct or opposite is result an evolution on the basis of physical base the transitory dyna_trans type or frequential of dyna_harmo type.

3.2 Operands TOUT_CHAM/NOM_CHAM

◇ / TOUT_CHAM = "OUI"

Makes it possible to transform by FFT direct or opposite the fields of symbolic name DEPL, QUICKLY and ACCE contained as a result generalized (tran_gene, harm_gene) or on physical base (dyna_trans, dyna_harmo).

◇ / NOM_CHAM = nomcha

List of symbolic names of field which one wishes to transform by FFT direct or opposite: "DEPL", "QUICKLY", "ACCE".

3.3 Operand METHODE

◇ METHODE =

algorithm FFT accepts in entry only one signal of which the number of samples is a power of 2.

Method "PROL_ZERO" (by default) proposes to prolong the input signal with zeros until having a nombre total of samples which is the first power of 2 whose value is higher than the initial number of samples.

Method "TRONCATURE" will consider only the first samples of which the nombre total is the greatest power of two whose value is lower than the initial number of samples.

For example, on a signal of 601 values, method "PROL_ZERO" will supplement the signal to have 1024 samples, whereas method "TRONCATURE" will consider only the first 512 times.

If the entry signal with a number of samples which is a power of 2, the two methods are obviously equivalent: one takes into account the signal without modifying it.

3.4 Operand SYMETRIE

◇ SYMETRIE =

Key word which applies only for the opposite transform of Fourier. The spectrum (complex) provided in entry of the opposite FFT must comply with certain rules (to find a real temporal function in particular): compared to its point medium, its real part must be symmetric and its leaves imaginary skew-symmetric. In general, if this spectrum comes from a computation of FFT, then these conditions of symmetry are observed (except voluntary truncation). On the other hand if one has only half of the spectrum, then it should be announced to the operator of computation of FFT.

This information of symmetry of the spectrum is managed by key word SYMETRIE. If the spectrum is complete thus respecting symmetries, then the user must specify SYMETRIE = "OUI". On the other hand, if the spectrum is truncated, then it is advisable to choose SYMETRIE = "NON". The spectrum is then symmetrized: that involves a multiplication by 2 of its number of samples and thus of its maximum frequency.

Consequently, this operand applies only if result to transform is a generalized frequential evolution (harm_gene) or on physical base (dyna_harmo).