# V
# - User Guide -

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# 1 Compressor: field compression module



## 1.1 Preamble

Compressor enables fields compression for arrays/pyTrees.

To use it with the Converter array interface, you must import the Compressor module:

```
import Compressor
```

Then, in the following, a is an array, and A a list of arrays.
To use it with the pyTree interface, you must import the module:

```
import Compressor.PyTree as Compressor
```

Then, in the following, a is a zone node and A is a list of zone nodes or a complete pyTree.

## 1.2 Index field compression

**Compressor.deltaIndex**: compress a list of indices using delta algorithm. Delta contains the number of added indices in a when compared to ref, the list of added indices, the number of suppressed indices, the list of suppressed indices:

```
delta = Compressor.deltaIndex(a, ref)
```

(See : Examples/Compressor/deltaIndex.py)

## 1.3 Object serializer/compressor

**Compressor.pack**: serialize/compress a python object a. This is a general interface to msgpack/pickle module:

| b = Compressor.pack(a) |
|---|

(See : Examples/Compressor/pack.py)

**Compressor.unpack**: deserialize/decompress a serialized stream b. This is a general interface to msgpack/pickle module:

| a = Compressor.unpack(b) |
|---|

(See : Examples/Compressor/unpack.py)

## 1.4 Index field compression

**Compressor.deltaInterpolations**: compress a list of interpolation data (interpolated and donor points, periodicity, interpolation coefficients) for a donor block, using delta algorithm. Delta contains the Id of interpolated blocks, the number of modified interpolations data by interpolated blocks in a when compared to ref, the list of modified interpolation data. The function is called for a given location (cell center or face center):

| delta = Compressor.deltaInterpolations(a, ref, loc) |
|---|

(See : Examples/Compressor/deltaInterpolationsPT.py)

## 1.5 Example files

Example file : Examples/Compressor/deltaIndex.py

```
# - deltaIndex -
import numpy
import Compressor

# Liste des indexes de reference
indRef = numpy.array([1,2,3,4,5], dtype='int32')

# Liste des indexes a comparer a la reference
index = numpy.array([1,2,3,4], dtype='int32')

delta = Compressor.deltaIndex(index, indRef)
print delta
```

Example file : Examples/Compressor/pack.py

```
# - pack -
import Compressor
import Generator.PyTree as G
a = G.cart((0,0,0), (1,1,1), (1000,100,100))
b = Compressor.pack(a)
```

Example file : Examples/Compressor/unpack.py

```
# - unpack -
import Compressor
import Generator.PyTree as G
a = G.cart((0,0,0), (1,1,1), (1000,100,100))
b = Compressor.pack(a)
c = Compressor.unpack(b)
```

Example file : Examples/Compressor/deltaInterpolationsPT.py

```
# - deltaInterpolations -
import numpy
import Compressor.PyTree as Compressor

# Liste des donnees d interpolations de reference
rcvIndices = numpy.array([1,2,3], dtype='int32')
donorIndices = numpy.array([1,5,6], dtype='int32')
periodicity = numpy.array([100,100,100], dtype='int32')
coefs1 = numpy.array([0.,0.,0.,0.,0.5,0.5,0.5], dtype='float')
coefs2 = numpy.array([0.,0.,0.,0.,0.5,0.5,0.5], dtype='float')
coefs3 = numpy.array([0.,0.,0.,0.,0.5,0.5,0.5], dtype='float')
coefficients = [coefs1,coefs2,coefs3]
indRef = [rcvIndices,donorIndices,periodicity,coefficients]

# Liste des donnees d interpolations a comparer a la reference
rcvIndices = numpy.array([2,3,4], dtype='int32')
donorIndices = numpy.array([5,6,7], dtype='int32')
periodicity = numpy.array([101,100,100], dtype='int32')
coefs2 = numpy.array([0.,0.,0.,0.,0.5,0.5,0.5], dtype='float')
coefs3 = numpy.array([0.,0.,0.,0.,0.5,0.5,0.5], dtype='float')
coefs4 = numpy.array([0.,0.,0.,0.,0.5,0.5,0.5], dtype='float')
coefficients = [coefs2,coefs3,coefs4]
index = [rcvIndices,donorIndices,periodicity,coefficients]

# Liste des indexes a comparer a la reference
delta = Compressor.deltaInterpolations(index, indRef, loc='cell')
print delta
```