11th SPINE meeting , ESA/ESTEC, 04/2007

Spacecraft Plasma Interaction System
Course and Practical Work
Part 2: Additional and Useful Tools

J.Forest(1), S.Jourdain(1), S. Bagnier(1),
contact@artenum.com
(1) Artenum, France;

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This lecture is given in parallel of the Practical Work: Open the project "SPINE_labWork1.spis"

For further information, please see the
SPIS Technical Note 01: USER MANUAL & QUICK START

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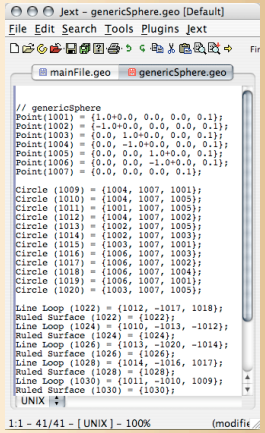
Don not hesitate to the embeded editer, Jext!

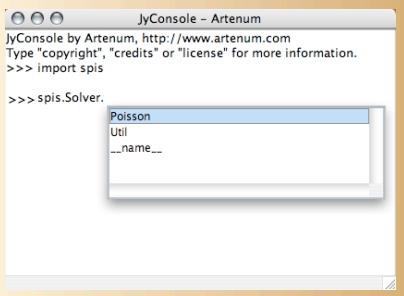


Edit -> File Editor

- Fully multi-platform
- Syntactic colorisation (Python, Java)
- Useful for:
  - Edit files and scripts (e.g CAD files, scenarios)
  - Control data

JyConsole, the integrated Jython/Python console

Click on the JYCONSOLE icon.



- SPIS-UI provides an advanced Jython/Python console, called JyConsole, providing
  - An access to all data shared in memory
  - An object oriented completion capability on all level of language (Python, Java,native through JNI....)
  - To perform processing scripts
  - To execute directly commands and Tasks

To access to the object oriented completion, just type: ***ctr+space***

To load scripts, just type: ***ctr+click inside the console***, this will give a contextual menu.

Units Converter

Units Converter – Characteristic Scales Editor

Name	Value	Unit	Define
gridLengthZ	10.0	'm'	' tildeLz, tilde...
gridLengthY	10.0	'm'	' tildeLy, tilde...
gridLengthX	10.0	'm'	' tildeLx, tilde...
gridSizeZ	10	''	' tildeLz'
gridSizeY	10	''	' tildeLy'
gridSizeX	10	''	' tildeLx'
density	10000000...	'cm^-3'	' lambdaD'
Bfield	0.0	'T'	' omegaC, til...
Temperature	0.5	'eV'	' Ttilde, lamb...

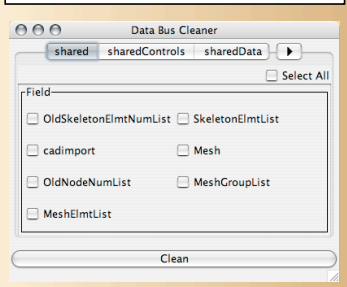
Name	Value	Expression	Input dependen	Ouput depe.
tildedX	1.9011011753163607	tildedX = gridL...	['gridLengthX...	['lambdaD']
NbCells	1000.0	NbCells = gridS...	['gridSizeX', '...	[]
Jth	1.8916452355894783E-6	Jth = density*s...	['density']	['Ttilde']
lambdaD	0.5260109314453455	lambdaD = ma...	['Temperatur...	['Ttilde']
Ttilde	8.0E-20	Ttilde = Temp...	['Temperature']	[]
omega	563397.4445621677	omega = math....	['density']	[]
Coeffl	9.014359112994683E-14	Coeffl = self.Q_...	[]	['omega']
tildeLz	19.011011753163608	tildeLz = gridL...	['gridLengthZ']	['lambdaD']
tildedZ	1.9011011753163607	tildedZ = gridL...	['gridLengthZ'...	['lambdaD']
tildeLy	19.011011753163608	tildeLy = gridLe...	['gridLengthY']	['lambdaD']
omegaC	0.0	omegaC = (self...	['Bfield']	[]
tildedY	1.9011011753163607	tildedY = gridL...	['gridLengthY'...	['lambdaD']
tildeB	0.0	tildeB = omega...	['Bfield']	['omegaC',...
tildeLx	19.011011753163608	tildeLx = gridL...	['gridLengthX']	['lambdaD']
ScalingRatio	1.9011011753163607	ScalingRatio = ...	[]	['lambdaD']

New Input Param | New Output Param | Remove Param | Compute | Save to DataBus

- Useful to:
  - Compute common characteristic scales, like Debye length
  - Convert units (e.g. PicUp3D's units)
  - Quit computation (like a simplified spreadsheet)

Data Bus Cleaner

Data Bus -> clean Data Bus menu

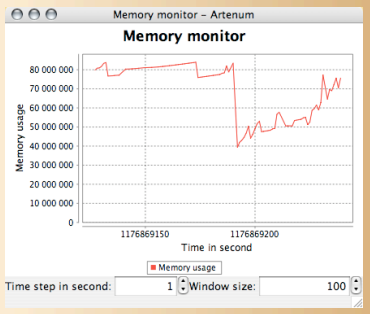


- All data are stored in memory through the central Common Data Bus.
- The Data Bus Cleaner can be used to reset individually or globally each data of the framework.
- Useful to reset DataFields and MeshFields.

BE CAREFUL! A wrong use can corrupt your model and results!

Memory monitor

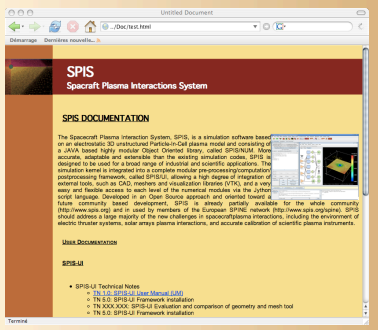
Tools -> Memory Monitor



- Useful to:
  - control the memory cost of your simulation.
  - Identify the memory bottlenecks and leaks.
- The monitoring time step can be adjusted.

Where to find more information ?

Help -> Online Help



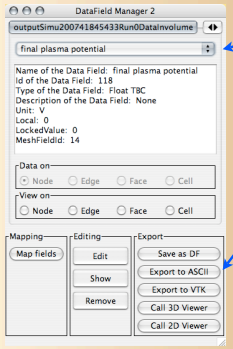
And please use the forums!

- SPIS provides its own documentation under HTML and PDF format.
- The embedded documentation contains:
  - The SPIS-UI User Manual
  - The SPIS-NUM manual
  - API documentation
  - Various developers documentation
- Additional information are available on the LibreSource platform of SPINE:

Please see: http://www.spis.org

How to export DataFields into ASCII formats ?

Use the DataField Manager



- Use the DataFields Manager:
  - 1) select the data
  - 2) Click on export to ACII
  - 3) Select the name of the output file

Data | Elm Id | Nodes Coordinates

```
# DataField export for volumic DataField
# DataValue MeshElmId Xnode1 Ynode1 Znode1 Xnode2 Ynode2 Znode2...
-2.2064244747161865 210 -0.4546387195587158 -0.7438393235206604 -0.48990482091903687
-2.2064247131347656 209 -0.2596653699874878 -0.8149804472923279 -0.5180548429489136
-2.2064244747161865 244 -0.3612787723541126 -0.8284458518028259 -0.42796629667282104
-2.2064247131347656 219 -0.4508131742477417 -0.4952149391174316 4 -0.7426503896713257
-2.2064244747161865 245 -0.5109481215477699 -0.6349646449089 05 -0.5794410109519958
-2.2064244747161865 211 -0.6055107116699219 -0.5195361375808716 -0.6028589606285095
-2.2064244747161865 105 0.0 -0.7818315029144287 -0.6234897971153259
-2.2064244747161865 106 0.0 -0.9009688496589661 -0.4338837265968323
-2.2064244747161865 104 0.0 -0.6234897971153259 -0.7818315029144287
-2.2064247131347656 207 -0.2125750482082367 -0.5372193456961 06 -0.816218912601471
-2.2064244747161865 103 0.0 -0.4338837265968323 -0.9009688496589661
```


End of the first part