

Cades 3.1.2

File Edit View Source Tools Window Help

ProjectsFiles

AlternateurGriffesProjectVesta-System

cadescadese3

Cades3Matlab\_VestaProjectg2elab

IM\_Optimisation/3g2elab

mylene1g2elab

pompeAInductiong2elab

rosenbrockg2elab

Models

bisphere

smilModel2

Solutions

resBisphere

result20190716134249

result20230313121530

result20230314124227

result20230315091239

result20230315092055

Data

specifications20230313121658Mon Mar 13 12:17:02 CET 2023

values20230313121306Mon Mar 13 12:13:11 CET 2023

values20230313121307Mon Mar 13 12:15:22 CET 2023

Dependencies

testFlyback1g2elab

testHacheur1V3g2elab

Transfo\_ensg2elab

VestaEnergyProjectMy Company

cppModel.cppdimensionnement\_3pt\_fctExternFunctionsmilModel2bispherebisphereresult20230315092055smilModel2

File Export

Input	Value	Unit	Output	Value	Unit
x1	0.56		ctr1	0.9148160000000001	
x2	0.0		ctr2	-1.44	
			ros	10.0280960000000003	

ComputeReset to Default

Plot

Scope

x10<sup>0</sup>

Control

GradientInputLogarithmic X PlotLogarithmic Y ScaleScope ControlsAutoscaleClearFormat

PlotStart-2End2Step0.1

Output - Messages

09:17:23: Bisphere - Optimization finished - Iterations : 4 - Total time : 10.0ms

09:18:12: bisphere - Start Optimization at 09:18:12 on 15 mars 2023

09:18:12: bisphere - Optimization finished - Iterations : 0 - Total time : 6.0ms

09:18:19: bisphere - Start Optimization at 09:18:19 on 15 mars 2023

09:18:19: bisphere - Optimization finished - Iterations : 0 - Total time : 10.0ms

09:18:43: bisphere - Start Optimization at 09:18:43 on 15 mars 2023

09:18:43: bisphere - Optimization finished - Iterations : 3 - Total time : 10.0ms

09:20:44: bisphere - Start Optimization at 09:20:44 on 15 mars 2023

09:20:44: bisphere - Optimization finished - Iterations : 10 - Total time : 40.0ms

09:21:05: bisphere - Start Optimization at 09:21:05 on 15 mars 2023

09:21:05: bisphere - Optimization finished - Iterations : 10 - Total time : 31.0ms

09:31:44: Loading completed.

09:32:01: Loading completed.

09:32:01: Loading completed.

09:33:09: Compute finished, time = 0ms

09:33:09: Plot finished, time=10 ms

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INS

Cades 3.1.2

File Edit View Source Tools Window Help

ProjectsFiles

AlternateurGriffesProjectVesta-System

cadescadese3

Cades3Matlab\_VestaProjectg2elab

IM\_OptimisationV3g2elab

mylene1g2elab

pompeAInductiong2elab

rosenbrockg2elab

Models

bisphere

smlModel2

Solutions

resBisphere

result20190716134249

result20230313121530

result20230314124227

result20230315091239

result20230315092055

Data

specifications20230313121658Mon Mar 13 12:17:02 CET 2023

values20230313121306Mon Mar 13 12:13:11 CET 2023

values20230313121307Mon Mar 13 12:15:22 CET 2023

Dependencies

testFlyback1g2elab

testHacheur1V3g2elab

Transfo\_ensG2Elab

VestaEnergyProjectMy Company

cppModel.cppdimensionnement\_3pt\_fctExternFunctionsmlModel2bispherebisphere

result20230315092055smlModel2smlModel2

File Export

Input	Value	Unit	Output	Value	Unit
x1	0.56		-ctr1	0.9148160000000001	
x2	0.0		-ctr2	-1.44	
			-ros	10.028096000000003	

ComputeReset to Default

Plot JacobianLocal sensitivityUncertainty propagationGlobal sensitivity

Compute sensitivities

Input name	Sensitivity type	Sensitivity value	$\Sigma\Delta[\%] = -3.889E-1$
$\Delta x1$	Relative	1	$\Sigma\Delta = 5.6E-3$
$\Delta x2$	Relative	1	$\Delta ctr2$

			-3.889E-1%
			0%

Output - Messages

09:19:19: bisphere - Start Optimization at 09:19:19 on 15 mars 2023

09:19:19: bisphere - Optimization finished - Iterations : 0 - Total time : 10.0ms

09:19:43: bisphere - Start Optimization at 09:19:43 on 15 mars 2023

09:19:43: bisphere - Optimization finished - Iterations : 3 - Total time : 10.0ms

09:20:44: bisphere - Start Optimization at 09:20:44 on 15 mars 2023

09:20:44: bisphere - Optimization finished - Iterations : 10 - Total time : 40.0ms

09:21:05: bisphere - Start Optimization at 09:21:05 on 15 mars 2023

09:21:05: bisphere - Optimization finished - Iterations : 10 - Total time : 31.0ms

09:31:44: Loading completed.

09:32:01: Loading completed.

09:32:01: Loading completed.

09:33:09: Compute finished, time = 0ms

09:33:09: Plot finished, time=10 ms

09:33:38: Loading completed.

09:33:54: Compute finished, time = 0ms

09:33:54: [ERROR]: 0 >= 0

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Projects | Files

- AlternateurGriffesProject Vesta-System
- cades ENSE3
- Cades3Matlab\_VestaProject g2elab
- IM\_OptimisationV3 g2elab
- mylene1 g2elab
- pompeAInduction g2elab
- rosenbrock g2elab
- Models
  - bisphere
  - smlModel2
- Solutions
  - resBisphere
  - result20190716134249
  - result20230313121530
  - result20230314124227
  - result20230315091239
  - result20230315092055
- Data
  - specifications20230313121658 Mon Mar 13 12:17:02 CET 2023
  - values20230313121306 Mon Mar 13 12:13:11 CET 2023
  - values20230313121307 Mon Mar 13 12:15:22 CET 2023
- Dependencies
  - testFlyback1 g2elab
  - testHacheurIV3 g2elab
  - Transfo\_ens G2Elab
  - VestaEnergyProject My Company

File Export

Input	Value	Unit	Output	Value	Unit
x1	0.56		ctr 1	0.9148160000000001	
x2	0.0		ctr 2	-1.44	
			ros	10.028096000000003	

Compute Reset to Default

Plot Jacobian Local sensitivity Uncertainty propagation Global sensitivity

Derive

	x1	x2
ctr 1	5.808E-1	-1
ctr 2	1	1
ros	6.937E1	-6.272E1

Output - Messages

```
09:18:43: bisphere - Optimisation finished - Iterations : 3 - Total time : 10.0ms
09:20:44: bisphere - Start Optimization at 09:20:44 on 16 mars 2023
09:20:44: bisphere - Optimisation finished - Iterations : 10 - Total time : 40.0ms
09:21:05: bisphere - Start Optimization at 09:21:05 on 16 mars 2023
09:21:05: bisphere - Optimisation finished - Iterations : 10 - Total time : 31.0ms
09:31:44: Loading completed.
09:32:01: Loading completed.
09:32:01: Loading completed.
09:33:09: Compute finished, time = 0ms
09:33:09: Plot finished, time=10 ms
09:33:38: Loading completed.
09:33:54: Compute finished, time = 0ms
09:33:54: [ERROR]: 0 >= 0
09:34:37: Compute finished, time = 0ms
09:34:37: [ERROR]: 0 >= 0
09:34:37: [ERROR]: 0 >= 0
```

Projects Files

- AlternateurGriffesProject Vesta-System
  - cades ENSE3
  - Cades3Matlab\_VestaProject g2elab
    - IM\_OptimisationV3 g2elab
    - mylene1 g2elab
    - pompeAIInduction g2elab
    - rosenbrock g2elab
      - Models
        - bisphere
        - smModel2
      - Solutions
        - resBisphere
        - result20190716134249
        - result20230313121530
        - result20230314124227
        - result20230315091239
        - result20230315092055
      - Data
        - specifications20230313121658 Mon Mar 13 12:17:02 CET 2023
        - values20230313121306 Mon Mar 13 12:13:11 CET 2023
        - values20230313121307 Mon Mar 13 12:15:22 CET 2023
      - Dependencies
        - testFlyback1 g2elab
        - testHacheur IV3 g2elab
        - Transfo\_ens G2Elab
    - VestaEnergyProject My Company

File Optimization Tools

Optimizer Input Output Result

Optimizer

Registered Optimizers: SQP - Gradient Sequential Quadratic Progra...

Gradient SQP VF13 Optimizer - V3.0 Beta 1.02

Precision : 1e-5

Max Iteration : 100

Stop optimization

Optimization output

☐ Save best optimum only

☒ Save optimum(s) and iterations

☐ Save all optimums

Output File: D:\soft\cades\_tools\tests\yos Browse...

Model: rosenbrock.smModel2-1.0.muse | Optimizer: SQP - Gradient Sequential Quadratic Programming | Constraints: ..... | Specification: specifications20230313121658.spec | Output: result20230313121530.result

Output - Messages

```
09:18:43: bisphere - Optimization finished - Iterations : 3 - Total time : 10.0ms
09:20:44: bisphere - Start Optimization at 09:20:44 on 16 mars 2023
09:20:44: bisphere - Optimization finished - Iterations : 10 - Total time : 40.0ms
09:21:05: bisphere - Start Optimization at 09:21:05 on 16 mars 2023
09:21:05: bisphere - Optimization finished - Iterations : 10 - Total time : 31.0ms
09:31:44: Loading completed.
09:32:01: Loading completed.
09:32:01: Loading completed.
09:33:09: Compute finished, time = 0ms
09:33:09: Plot finished, time=10 ms
09:33:38: Loading completed.
09:33:54: Compute finished, time = 0ms
09:33:54: [ERROR]: 0 >= 0
09:34:37: Compute finished, time = 0ms
09:34:37: [ERROR]: 0 >= 0
09:34:37: [ERROR]: 0 >= 0
```

Cades 3.1.2

File Edit View Source Tools Window Help

Projects Files

- AlternateurGriffesProject Vesta-System
  - cades ENSE3
  - Cades3Matlab\_VestaProject g2elab
    - IM\_OptimisationV3 g2elab
    - mylene1 g2elab
    - pompeAInduction g2elab
    - rosenbrock g2elab
  - Models
    - bisphere
    - smiModel2
  - Solutions
    - resBisphere
      - result20190716134249
      - result20230313121530
      - result20230314124227
      - result20230315091239
      - result20230315092055
  - Data
    - specifications20230313121658 Mon Mar 13 12:17:02 CET 2023
    - values20230313121306 Mon Mar 13 12:13:11 CET 2023
    - values20230313121307 Mon Mar 13 12:15:22 CET 2023
  - Dependencies
- testFlyback1 g2elab
- testHacheur1V3 g2elab
- Transfo\_ens G2Elab
- VestaEnergyProject My Company

File Optimization Tools

Optimizer Input Output Result

x2

Gradient SQP HSL VF13

Init: 0.0

Type: Contraint

Min: -2.0

Max: 2.0

Save setting Ignore

Model: rosenbrock.smiModel2-1.0.muse | Optimizer: SQP - Gradient Sequential Quadratic Programming | Constraints: ..... | Specification: specifications20230313121658.spec | Output: result20230313121530.result

Output - Messages

```
09:19:45: bisphere - Optimisation finished - Iterations : 4 - Total time : 10.0ms
09:20:44: bisphere - Start Optimization at 09:20:44 on 15 mars 2023
09:20:44: bisphere - Optimization finished - Iterations : 10 - Total time : 40.0ms
09:21:05: bisphere - Start Optimization at 09:21:05 on 15 mars 2023
09:21:05: bisphere - Optimization finished - Iterations : 10 - Total time : 31.0ms
09:31:44: Loading completed.
09:32:01: Loading completed.
09:32:01: Loading completed.
09:33:09: Compute finished, time = 0ms
09:33:09: Plot finished, time=10 ms
09:33:38: Loading completed.
09:33:54: Compute finished, time = 0ms
09:33:54: [ERROR]: 0 >= 0
09:34:37: Compute finished, time = 0ms
09:34:37: [ERROR]: 0 >= 0
09:34:37: [ERROR]: 0 >= 0
```

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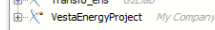


Projects | Files

- AlternateurGriffesProject Vesta-System
  - cadex ENSE3
  - Cades3Matlab\_VestaProject g2elab
  - IM\_OptimisationV3 g2elab
  - mylene1 g2elab
  - pompeAInduction g2elab
  - rosenbrock g2elab
  - Models
    - bisphere
    - smModel2
  - Solutions
    - resBisphere
    - result20190716134249
    - result20230313121530
    - result20230314124227
    - result20230315091239
    - result20230315092055
  - Data
    - specifications20230313121658 Mon Mar 13 12:17:02 CET 2023
    - values20230313121306 Mon Mar 13 12:13:11 CET 2023
    - values20230313121307 Mon Mar 13 12:15:22 CET 2023
  - Dependencies
- testFlyback1 g2elab
- testTracheur IV3 g2elab
- Transfo\_ens G2Elab
- VestaEnergyProject My Company

Cades 3.1.2

File Edit View Source Tools Window Help



Projects | Files

- AlternateurGriffesProject Vesta-System
  - cadex ENSE3
  - Cades3Matlab\_VestaProject g2elab
  - IM\_OptimisationV3 g2elab
  - mylene1 g2elab
  - pompeAInduction g2elab
  - rosenbrock g2elab
  - Models
    - bisphere
    - smModel2
  - Solutions
    - resBisphere
    - result20190716134249
    - result20230313121530
    - result20230314124227
    - result20230315091239
    - result20230315092055
  - Data
    - specifications20230313121658 Mon Mar 13 12:17:02 CET 2023
    - values20230313121306 Mon Mar 13 12:13:11 CET 2023
    - values20230313121307 Mon Mar 13 12:15:22 CET 2023
  - Dependencies
- testFlyback1 g2elab
- testTracheur IV3 g2elab
- Transfo\_ens G2Elab
- VestaEnergyProject My Company

&lt;

File Optimization Tools

Optimizer | Input | Output | Result

Gradient SQP HSL VF13

Type : **Minimiser**

Min : **Fixé**

Max : **Contraint**

Save setting : **Minimiser**

Libre

Cades 3.1.2

File Edit View Source Tools Window Help



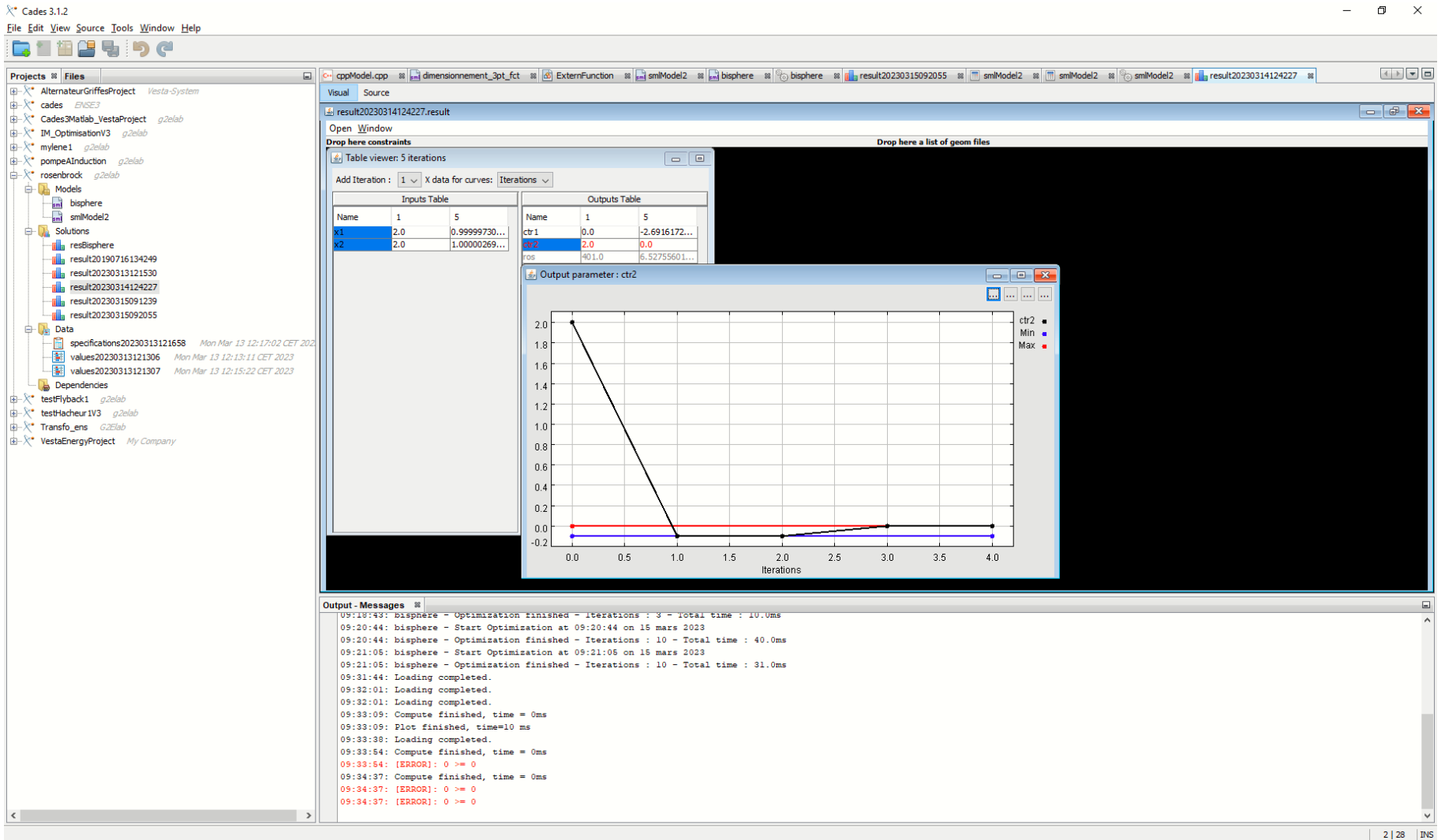
Projects | Files

- AlternateurGriffesProject Vesta-System
  - cadex ENSE3
  - Cades3Matlab\_VestaProject g2elab
  - IM\_OptimisationV3 g2elab
  - mylene1 g2elab
  - pompeAInduction g2elab
  - rosenbrock g2elab
  - Models
    - bisphere
    - smModel2
  - Solutions
    - resBisphere
    - result20190716134249
    - result20230313121530
    - result20230314124227
    - result20230315091239
    - result20230315092055
  - Data
    - specifications20230313121658 Mon Mar 13 12:17:02 CET 2023
    - values20230313121306 Mon Mar 13 12:13:11 CET 2023
    - values20230313121307 Mon Mar 13 12:15:22 CET 2023
  - Dependencies
- testFlyback1 g2elab
- testTracheur IV3 g2elab
- Transfo\_ens G2Elab
- VestaEnergyProject My Company

Model: rosenbrock.smModel2-1.0.muse | Optimizer: SQP - Gradient Sequential Quadratic Programming | Constraints: ..... | Specification: specifications20230313121658.spec | Output: result20230313121530.result

Output - Messages

```
09:18:43: bisphere - Optimization finished - iterations : 3 - Total time : 10.0ms
09:20:44: bisphere - Start Optimization at 09:20:44 on 16 mars 2023
09:20:44: bisphere - Optimization finished - Iterations : 10 - Total time : 40.0ms
09:21:05: bisphere - Start Optimization at 09:21:05 on 16 mars 2023
09:21:05: bisphere - Optimization finished - Iterations : 10 - Total time : 31.0ms
09:31:44: Loading completed.
09:32:01: Loading completed.
09:32:01: Loading completed.
09:33:09: Compute finished, time = 0ms
09:33:09: Plot finished, time=10 ms
09:33:39: Loading completed.
09:33:54: Compute finished, time = 0ms
09:33:54: [ERROR]: 0 >= 0
09:34:37: Compute finished, time = 0ms
09:34:37: [ERROR]: 0 >= 0
09:34:37: [ERROR]: 0 >= 0
```



The screenshot displays the Cades 3.1.2 software interface. On the left, a project tree shows a hierarchy of folders and files, including 'AlternateurGriffesProject', 'cades', 'Cades3Matlab\_VestaProject', 'IM\_OptimisationV3', 'mylene1', 'pompeAInduction', 'rosenbrock', 'Models', 'Solutions', 'Data', and 'Dependencies'. The 'Models' folder is expanded, showing 'bisphere' and 'smiModel2'. The 'Solutions' folder is also expanded, showing 'resBisphere' and several result files. The 'Data' folder is expanded, showing 'specifications20230313121658', 'values20230313121306', and 'values20230313121307'. The 'Dependencies' folder is expanded, showing 'testFlyback1', 'testHacheur1V3', 'Transfo\_ens', and 'VestaEnergyProject'.

The main window displays the 'Optimization' configuration window. The 'Optimizer' section shows 'Pareto Strategy' selected. The 'Pareto Proximity Strategy Optimizer - V3.0 Beta 1' section shows 'SQP - Gradient Sequential Quadratic Program...' selected. The 'Optimizer configuration' section shows 'Gradient SQP VF13 Optimizer - V3.0 Beta 1.02' selected, with 'Precision' set to '1e-5' and 'Max Iteration' set to '100'. The 'Export result as .csv' checkbox is unchecked. The 'Optimization output' section shows 'Save optimum(s) and iterations' selected. The 'Output File' is 'D:\soft\cades\_tools\tests\yosi', with a 'Browse...' button next to it.

The 'Output - Messages' window at the bottom shows the following log:

```
09:18:43: bisphere - Optimization finished - Iterations : 3 - Total time : 10.0ms
09:20:44: bisphere - Start Optimization at 09:20:44 on 15 mars 2023
09:20:44: bisphere - Optimization finished - Iterations : 10 - Total time : 40.0ms
09:21:05: bisphere - Start Optimization at 09:21:05 on 15 mars 2023
09:21:05: bisphere - Optimization finished - Iterations : 10 - Total time : 31.0ms
09:31:44: Loading completed.
09:32:01: Loading completed.
09:32:01: Loading completed.
09:33:09: Compute finished, time = 0ms
09:33:09: Plot finished, time=10 ms
09:33:38: Loading completed.
09:33:54: Compute finished, time = 0ms
09:33:54: [ERROR]: 0 >= 0
09:34:37: Compute finished, time = 0ms
09:34:37: [ERROR]: 0 >= 0
09:34:37: [ERROR]: 0 >= 0
```



Cades 3.1.2  
File Edit View Source Tools Window Help

Projects Files

- AlternateurGriffesProject Vesta-System
  - cades ENSE3
    - Cades3Matlab\_VestaProject g2elab
      - IM\_OptimisationV3 g2elab
        - mylene1 g2elab
          - pompeAInduction g2elab
            - rosenbrock g2elab
              - Models
                - bisphere
                  - smModel2
                    - Solutions
                      - resBisphere
                        - result20190716134249
                          - result20230313121530
                            - result20230314124227
                              - result20230315091239
                                - result20230315092055

- Data
- specifications20230313121658 Mon Mar 13 12:17:02 CET 2023
- values20230313121306 Mon Mar 13 12:13:11 CET 2023
- values20230313121307 Mon Mar 13 12:15:22 CET 2023
- Dependencies
- testFlyback1 g2elab
- testHacheur IV3 g2elab
- Transfo\_ens G2Elab
- VestaEnergyProject My Company

File Optimization Tools

Optimizer Input Output Result

fobj1  
fobj2

☒ Trace parameter

Minimum value : 0.0

Maximum value : 2.0

Point number : 10

☐ Logarithmic scale

Save setting ignore

Model: rosenbrock.bisphere-1.0.muse | Optimizer: Pareto Strategy | Constraints: ..... | Specification: ..... | Output: result20230315092055.result

Output - Messages

```
09:19:43: bisphere - Optimization finished - Iterations : 3 - total time : 10.0ms
09:20:44: bisphere - Start Optimization at 09:20:44 on 15 mars 2023
09:20:44: bisphere - Optimization finished - Iterations : 10 - Total time : 40.0ms
09:21:06: bisphere - Start Optimization at 09:21:06 on 18 mars 2023
09:21:06: bisphere - Optimization finished - Iterations : 10 - Total time : 31.0ms
09:31:44: Loading completed.
09:32:01: Loading completed.
09:32:01: Loading completed.
09:33:09: Compute finished, time = 0ms
09:33:09: Plot finished, time=10 ms
09:33:38: Loading completed.
09:33:54: Compute finished, time = 0ms
09:33:54: [ERROR]: 0 >= 0
09:34:37: Compute finished, time = 0ms
09:34:37: [ERROR]: 0 >= 0
09:34:37: [ERROR]: 0 >= 0
```

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Projects Files

- AlternateurGriffesProject Vesta-System
- cades ENS3
- Cades3Matlab\_VestaProject g2elab
- IM\_OptimisationV3 g2elab
- mylene1 g2elab
- pompeAInduction g2elab
- rosenbrock g2elab
- Models
  - bisphere
  - smIModel2
- Solutions
  - resBisphere
  - result20190716134249
  - result20230313121530
  - result20230314124227
  - result20230315091239
  - result20230315092055
- Data
  - specifications20230313121658 Mon Mar 13 12:17:02 CET 2023
  - values20230313121306 Mon Mar 13 12:13:11 CET 2023
  - values20230313121307 Mon Mar 13 12:15:22 CET 2023
- Dependencies
  - testFlyback1 g2elab
  - testHacheur1V3 g2elab
  - Transfo\_ens G2Elab
  - VestaEnergyProject My Company

Visual Source

result20230315092055.result

Open Window

Drop here constraints

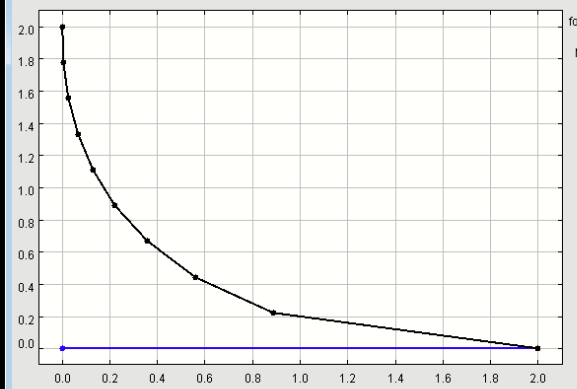
Table viewer: 11 iterations

Add Iteration : 1 X data for curves: fobj1

| Inputs Table |               |               | Outputs Table |               |               |
|--------------|---------------|---------------|---------------|---------------|---------------|
| Name         | 1             | 11            | Name          | 1             | 11            |
| z1           | 2.07573795... | 1.00001585... |               | 1.99999347... | 4.07327664... |
| z2           | 0.99999881... | 1.24920513... | fobj2         | 5.72268241... | 2.00000671... |

Drop here a list of geom files

Output parameter: fobj2



Output - Messages

```
09:18:43: bisphere - Optimization finished - Iterations : 3 - Total time : 10.0ms
09:20:44: bisphere - Start Optimization at 09:20:44 on 16 mars 2023
09:20:44: bisphere - Optimization finished - Iterations : 10 - Total time : 40.0ms
09:21:05: bisphere - Start Optimization at 09:21:05 on 16 mars 2023
09:21:05: bisphere - Optimization finished - Iterations : 10 - Total time : 31.0ms
09:31:44: Loading completed.
09:32:01: Loading completed.
09:32:01: Loading completed.
09:33:09: Compute finished, time = 0ms
09:33:09: Plot finished, time=10 ms
09:33:38: Loading completed.
09:33:54: Compute finished, time = 0ms
09:33:54: [ERROR]: 0 >= 0
09:34:37: Compute finished, time = 0ms
09:34:37: [ERROR]: 0 >= 0
09:34:37: [ERROR]: 0 >= 0
```