PZFlex

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Run Flex | Run Review | Run Build | Kill Run | Button

Run

Print | Settings

Review

Model Tree

- Project Data
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  - Axis Definitions
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Review

Model Tree

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Open File

Loading and unpacking model data.

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Model Tree

- Project Data
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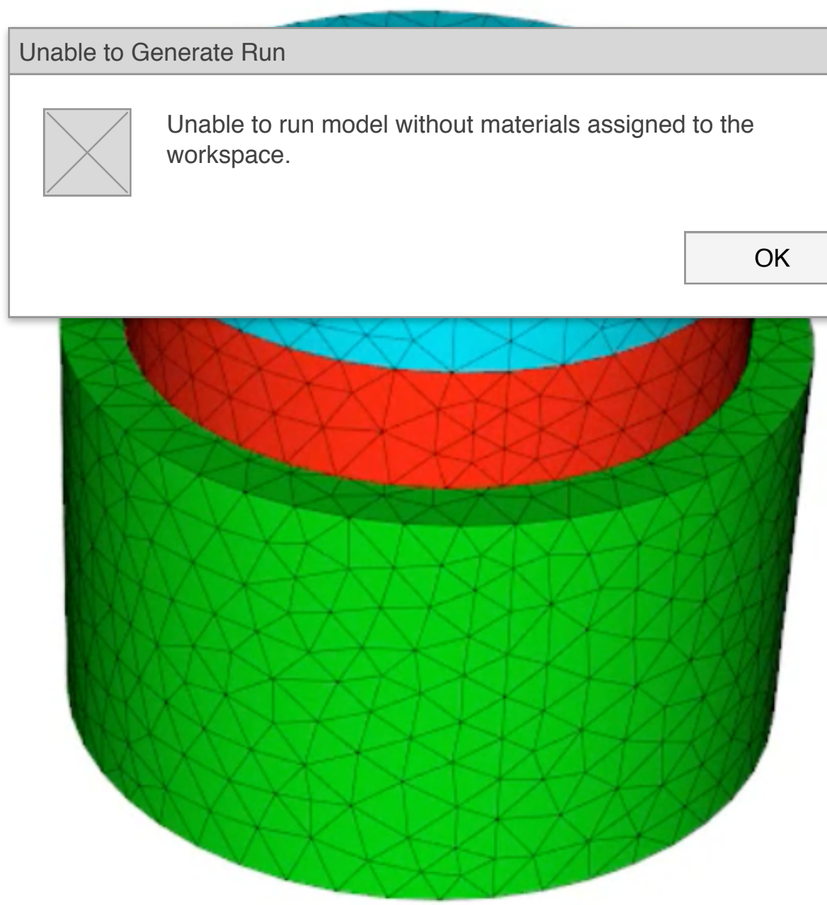
- Runtime

Sample Fil… | Sample Fil… | Sample Fil…



Unable to Generate Run

Unable to run model without materials assigned to the workspace.

OK

PZFlex

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Run | Review

Model Tree

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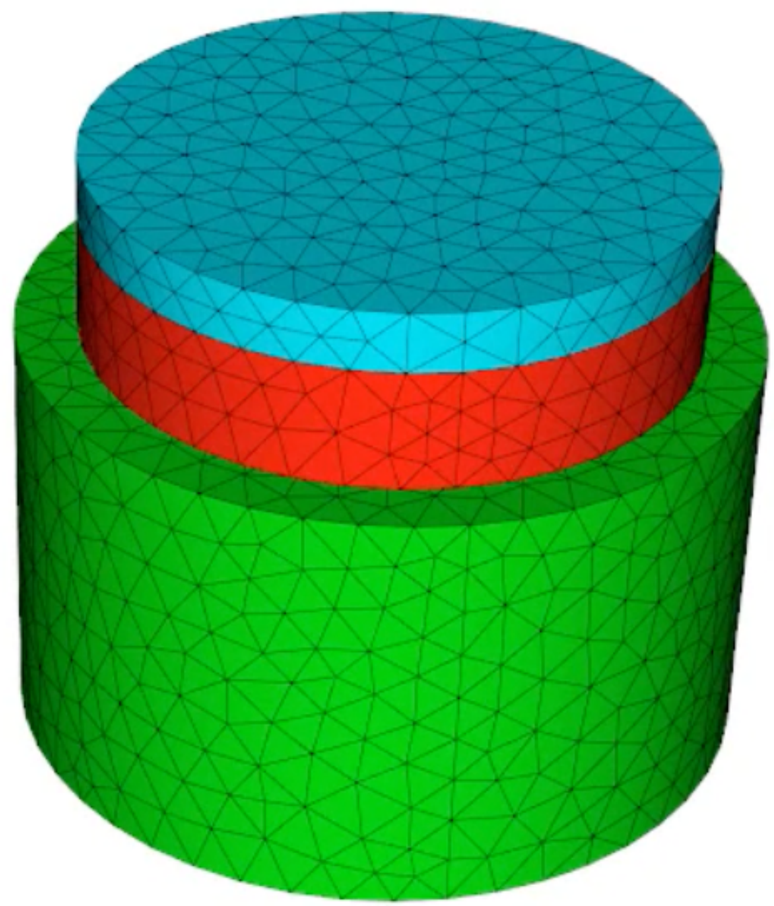
Sample Fil… | Sample Fil… | Sample Fil…



PZFlex

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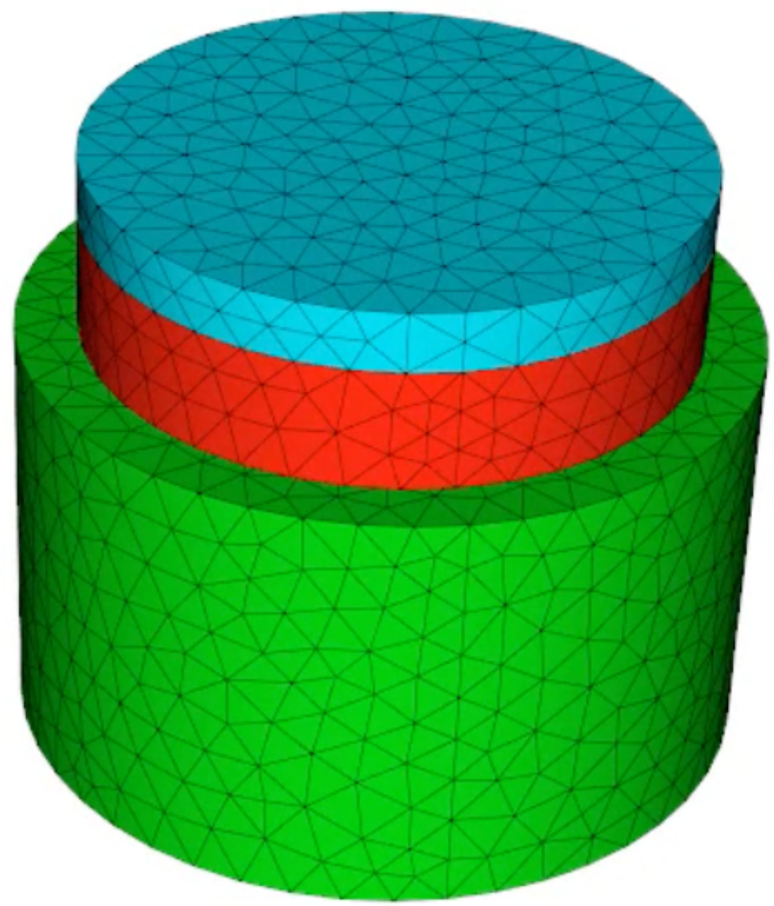
Project Materials | Add New | Import Global Material(s) | Import Project Material(s) | Export Global Material(s) | Export Project Material(s)

Model Tree

- Project Data
  - Materials
  - Drives
  - Axis Definitions
- Geometry
- Grid
- Loads
- Boundaries
- Outputs
- Analysis
- Runtime

Sample Fil… | Sample Fil… | Sample Fil…



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View: Reset View, Configure View Port, Button

Shape: Set Plane, Rotate Model, Flip Symmetry

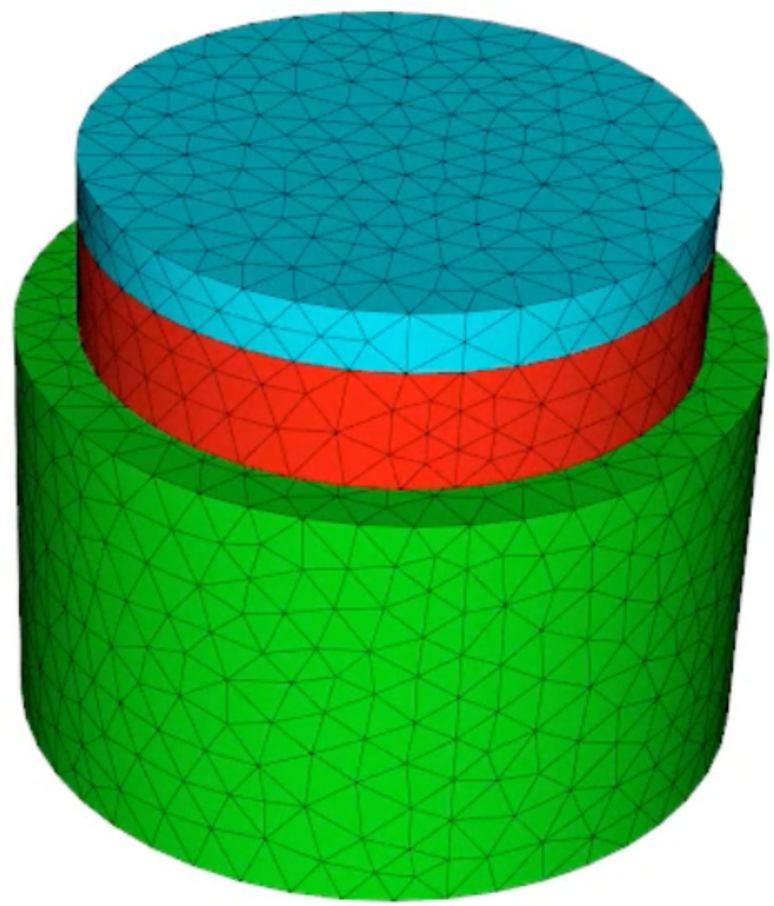
Model: Show Model Boundries, Show Model Dimensions, Show Deformed Model (2D), Plot Deformed Displacement, Animate Plot

Tools: Measurement Tool, Cutting Plane Tool, Data Probe Tool, Multi Point Data Probe, Data Spline Tool, Export Splined Data Tool

Model Tree

- Project Data
  - Materials
  - Drives
  - Axis Definitions
- Geometry
- Grid
- Loads
- Boundaries
- Outputs
- Analysis
- Runtime

Sample Fil… | Sample Fil… | Sample Fil…



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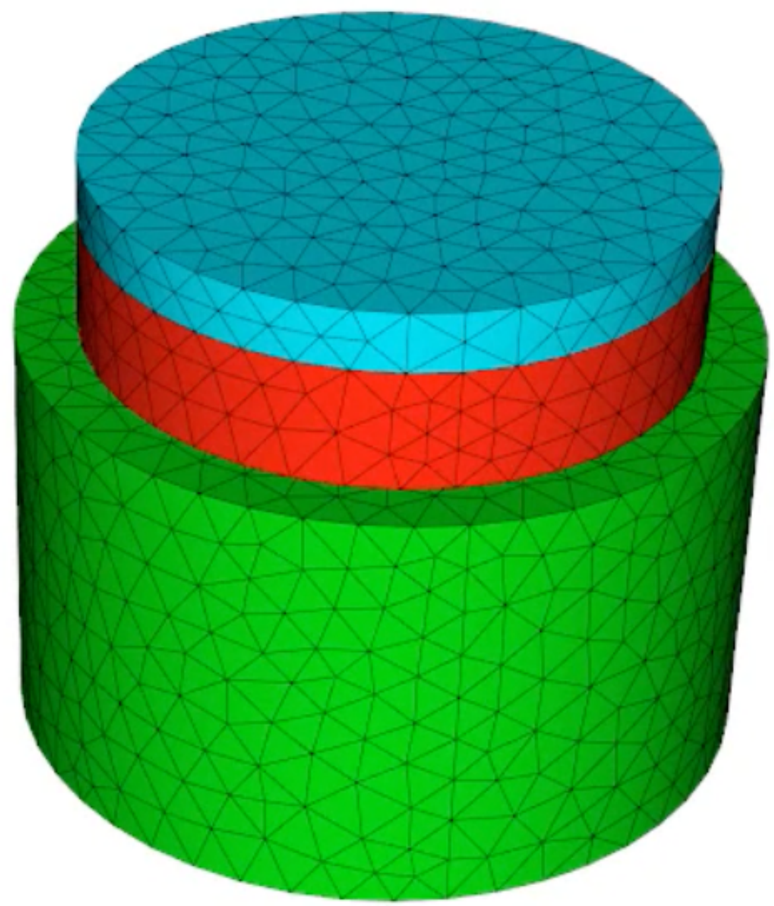
Axis Tool | Time Function Tool | Batch Controller Tool | Job Scheduler Tool

Model Tree

- Project Data
  - Materials
  - Drives
  - Axis Definitions
- Geometry
- Grid
- Loads
- Boundaries
- Outputs
- Analysis
- Runtime

Sample Fil… | Sample Fil… | Sample Fil…



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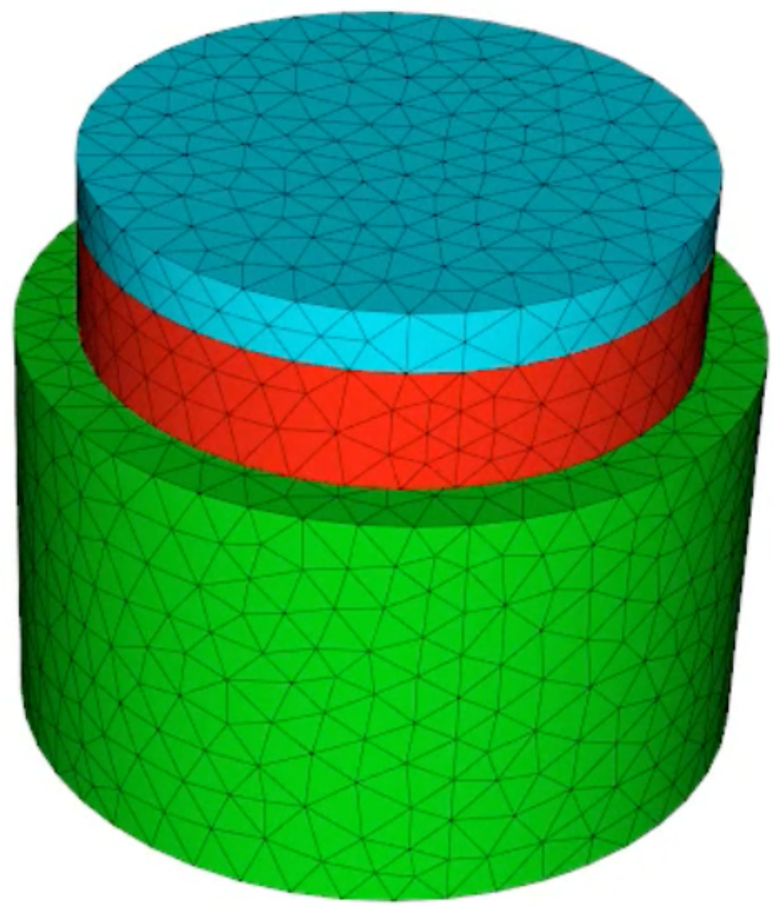
Model Tree

- Project Data
  - Materials
  - Drives
  - Axis Definitions
- Geometry
- Grid
- Loads
- Boundaries
- Outputs
- Analysis
- Runtime

Sample Fil… | Sample Fil… | Sample Fil…



PZFlex

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Run Flex | Run Review | Run Build | Kill Run | Button | Print | Settings

Run | Review

Model Tree

- Project Data
  - Materials
    - Mat 1
    - Mat 2
  - Drives
  - Axis Definitions
- Geometry
- Grid
- Loads
- Boundaries
- Outputs
- Analysis
- Runtime

Model Properties

Project Data

Label

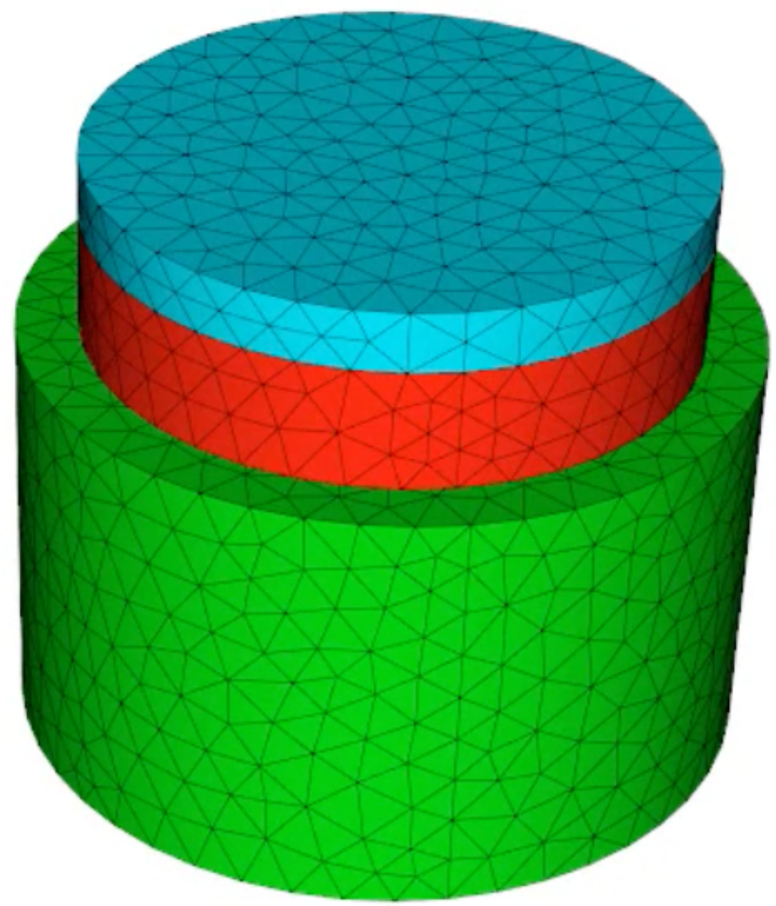
1

Label

ABC

Color

Sample Fil… | Sample Fil… | Sample Fil…



PZFlex

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Run | Review

Model Tree

- Project Data
  - Materials
  - Drives
  - Axis Definitions
- Geometry
- Grid
- Loads
- Boundaries
- Outputs
- Analysis
- Runtime

Model Properties

Project Data

Source File

file.step

BDF File

file.bdf

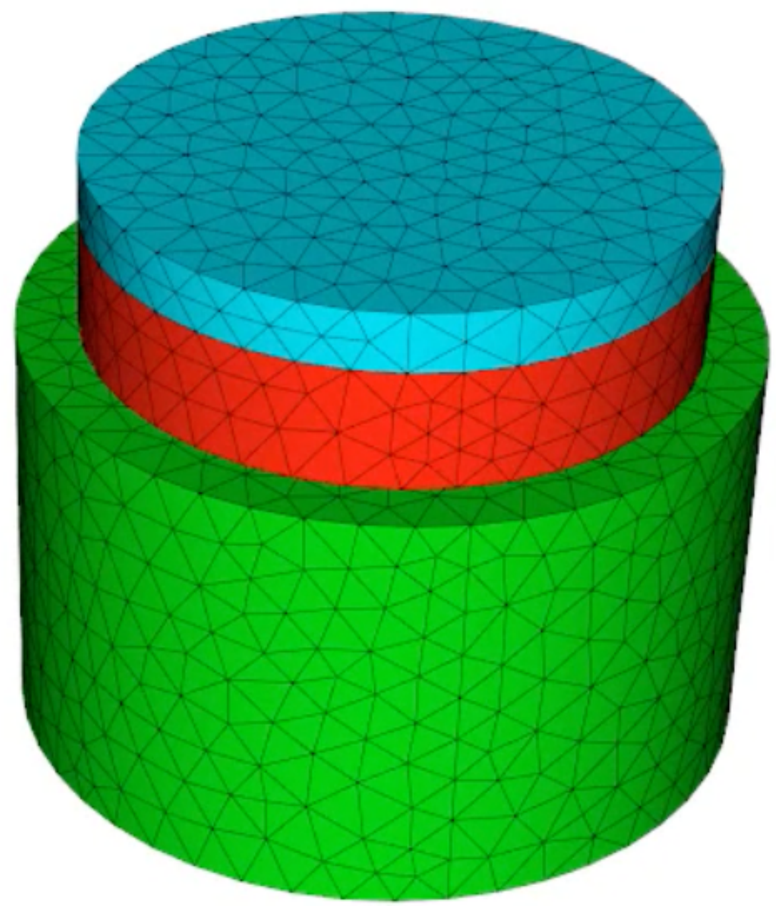
BDF File Node Count

2814

BDF File Element Count

13401

Sample Fil… | Sample Fil… | Sample Fil…



PZFlex

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Model Tree

- Project Data
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    - Mat 2
  - Drives
    - Drive 1
    - Drive 2
  - Axis Definitions
- Geometry
- Grid
- Loads
- Boundaries
- Outputs
- Analysis
- Runtime

Model Properties

Drive Property

Drive Name

Drive 1

Drive Type

Gaussain

Drive Frequency (kHz)

Number of Cycles

1

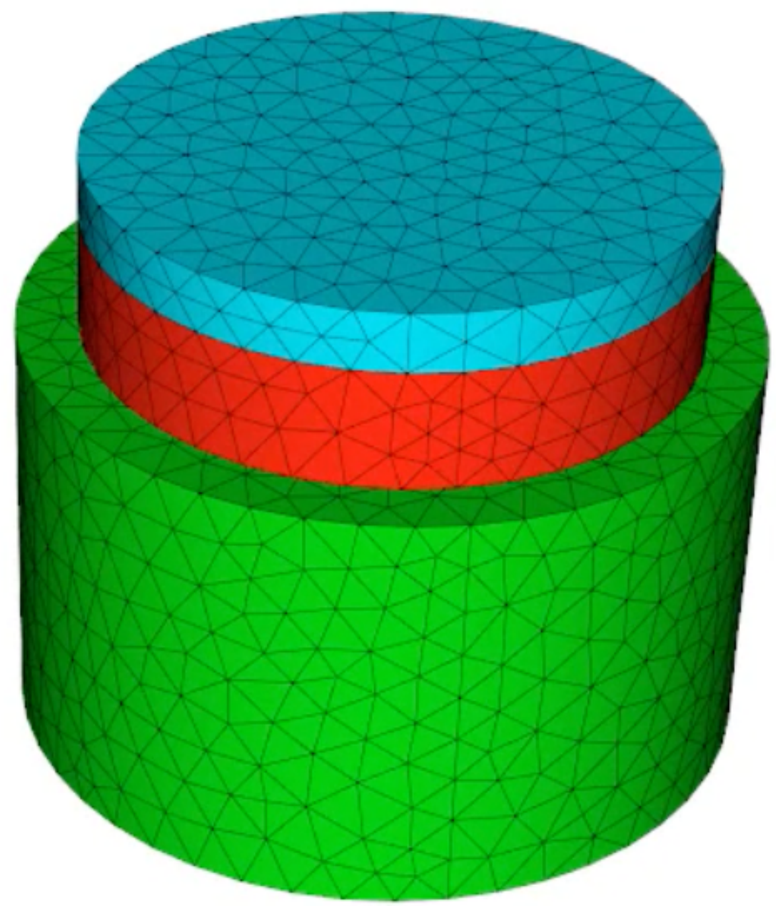
Amplitude (Pa-p-p)

1.00

Ramp Signal Number of Cycles

0

Sample Fil… | Sample Fil… | Sample Fil…



PZFlex

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Run | Review

Model Tree

- Project Data
  - Materials
    - Mat 1
    - Mat 2
  - Drives
    - Drive 1
    - Drive 2
  - Axis Definitions
    - Axis 1
- Geometry
- Grid
- Loads
- Boundaries
- Outputs
- Analysis
- Runtime

Model Properties

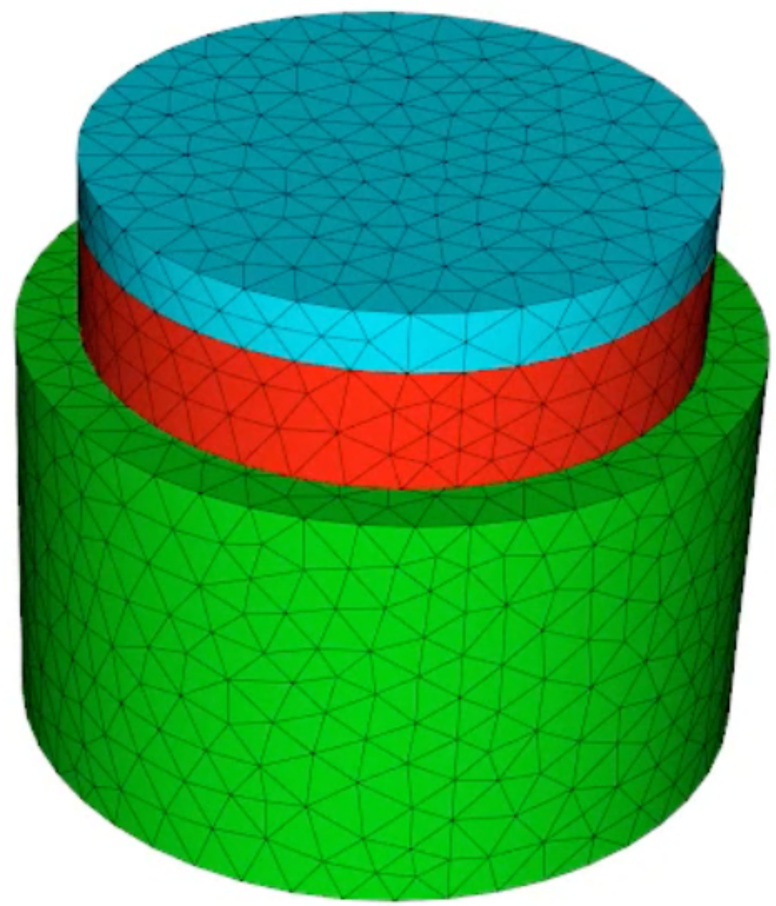
Axis Property

Axis Name

Axis 1

	Offset (m)	Rotation	Boundary
X	0	90.0	
Y	0	90.0	
Z	0	90.0	

Sample Fil… | Sample Fil… | Sample Fil…



PZFlex

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Model Tree

- Project Data
  - Materials
    - Mat 1
    - Mat 2
  - Drives
    - Drive 1
    - Drive 2
  - Axis Definitions
    - Axis 1
- Geometry
  - Part 1
  - Part 2
- Grid
- Loads
- Boundaries
- Outputs
- Analysis
- Runtime

Model Properties

Geometry Properties

Geometry Name

Part 1

Assigned Material

Gold

Associated Axis

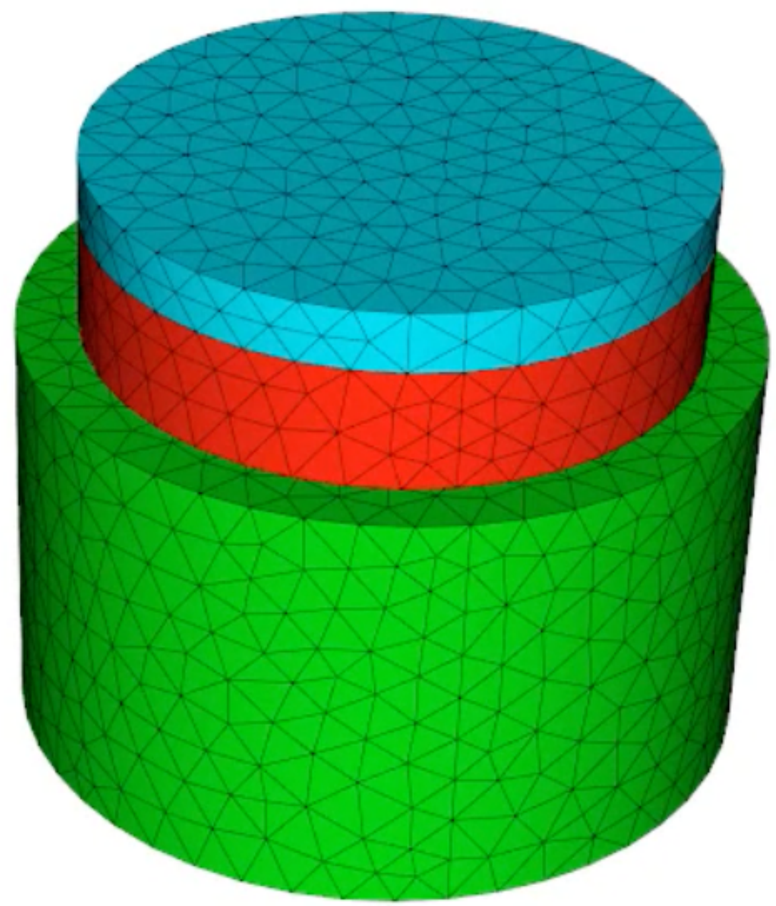
X

Scale

1.00

Color

Sample Fil… | Sample Fil… | Sample Fil…



PZFlex

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Run | Review

Model Tree

- Project Data
  - Materials
    - Mat 1
    - Mat 2
  - Drives
    - Drive 1
    - Drive 2
  - Axis Definitions
    - Axis 1
- Geometry
  - Part 1
  - Part 2
- Grid
  - Mesh Control Points
    - X Axis
      - Point 1
      - Point 2
    - Y Axis
    - Z Axis
  - Refinement Level
- Loads
- Boundaries
- Outputs
- Analysis
- Runtime

Model Properties

Mesh Control Point

Mesh Control Point Name

Point 1

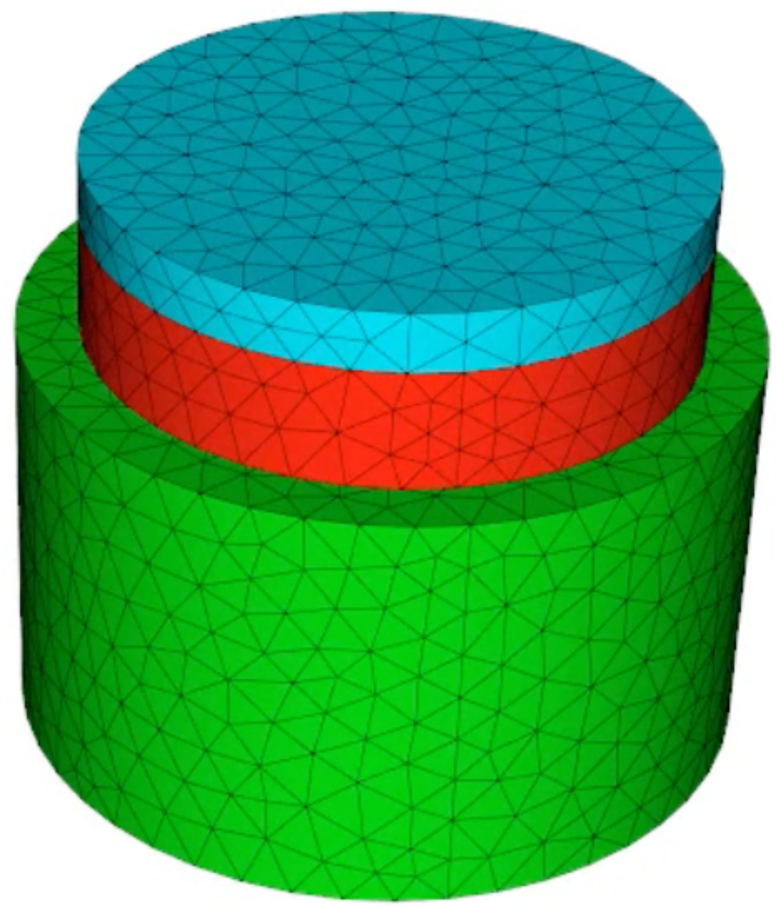
Associated Axis

X

Control Point (mm)

20

Sample Fil… | Sample Fil… | Sample Fil…



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Model Tree

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  - Mesh Control Points
    - X Axis
      - Point 1
      - Point 2
    - Y Axis
    - Z Axis
  - Refinement Level
- Loads
  - Load 1
  - Load 2
- Boundaries
- Outputs
- Analysis
- Runtime

Model Properties

Load Property

Load Name

Load 1

Associated Material

Mat 1

Load Type

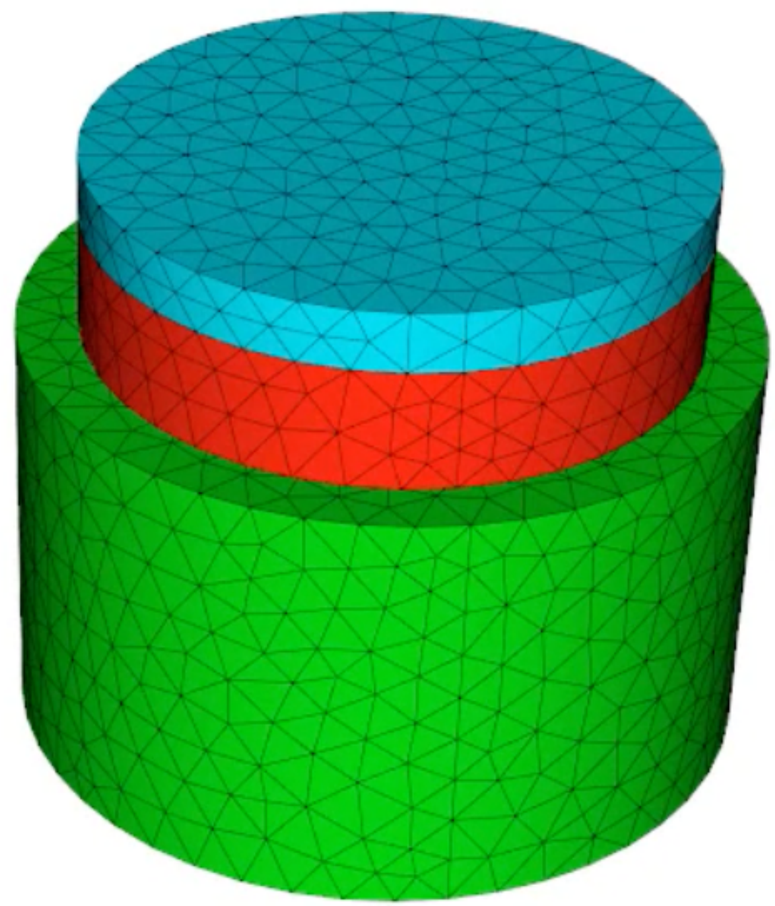
Pressure (PLOD)

Associated Drive

Drive 1

Color

Sample Fil… | Sample Fil… | Sample Fil…



PZFlex

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Run | Review

Model Tree

- Project Data
  - Materials
    - Mat 1
    - Mat 2
  - Drives
    - Drive 1
    - Drive 2
  - Axis Definitions
    - Axis 1
- Geometry
  - Part 1
  - Part 2
- Grid
  - Mesh Control Points
    - X Axis
      - Point 1
      - Point 2
    - Y Axis
    - Z Axis
  - Refinement Level
- Loads
  - Load 1
  - Load 2
- Boundaries
  - Bnd 1
  - Bnd 2
- Outputs
- Analysis
- Runtime

Model Properties

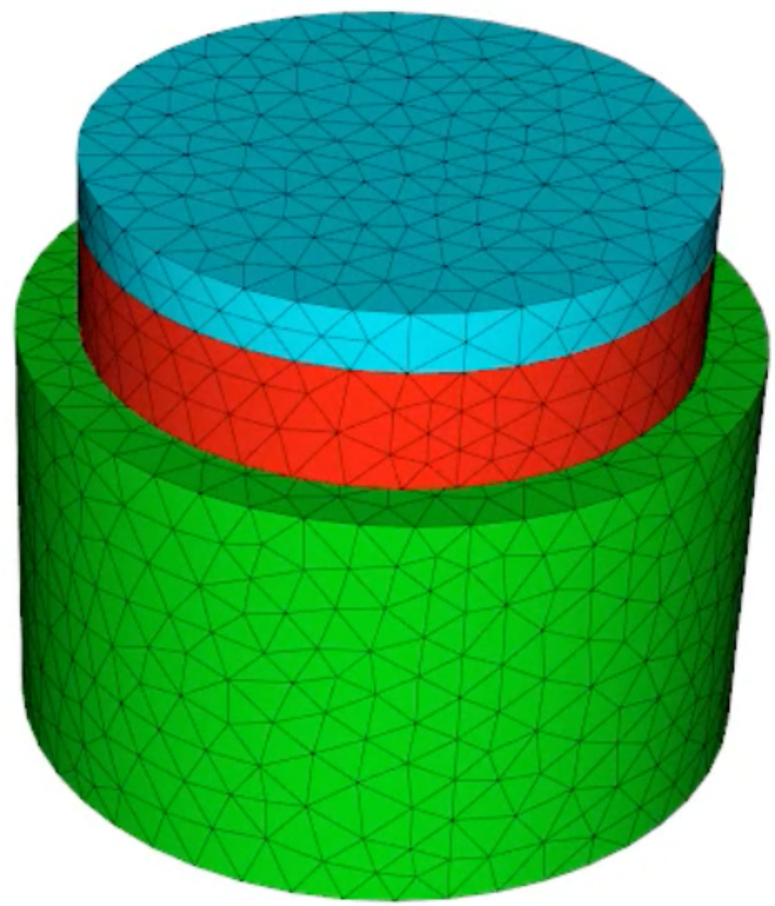
Boundaries Property

Boundary Name

Bnd 1

	Minimum	Maximum
X	SYMM	FREE
Y		
Z		

Sample Fil… | Sample Fil… | Sample Fil…



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Run | Review

Model Tree

- Mat 1
- Mat 2
- Drives
  - Drive 1
  - Drive 2
- Axis Definitions
  - Axis 1
- Geometry
  - Part 1
  - Part 2
- Grid
  - Mesh Control Points
    - X Axis
      - Point 1
      - Point 2
    - Y Axis
    - Z Axis
  - Refinement Level
- Loads
  - Load 1
  - Load 2
- Boundaries
  - Bnd 1
  - Bnd 2
- Outputs
  - Output 1
  - Output 2
- Analysis
- Runtime

Model Properties

Output Property

Output Name

Output 1

Output Type

Time History

Array

Acoustic Pressure

Component

APRS

Location (m)

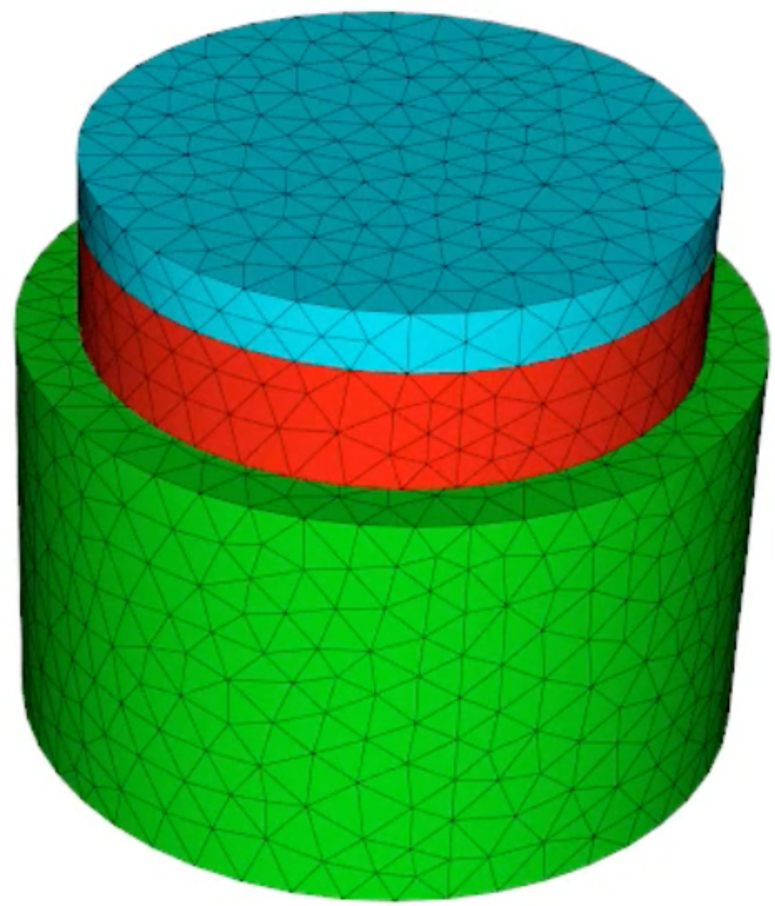
X 0

Y 0

Z 0

Color

Sample Fil… | Sample Fil… | Sample Fil…



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Run | Review

Model Tree

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- Drives
  - Drive 1
  - Drive 2
- Axis Definitions
  - Axis 1
- Geometry
  - Part 1
  - Part 2
- Grid
  - Mesh Control Points
    - X Axis
      - Point 1
      - Point 2
    - Y Axis
    - Z Axis
  - Refinement Level
- Loads
  - Load 1
  - Load 2
- Boundaries
  - Bnd 1
  - Bnd 2
- Outputs
  - Output 1
  - Output 2
- Analysis
- Runtime

Model Properties

Output Property

Output Name

Output 1

Output Type

Time History
Maximum
Extrapolation Plane

Component

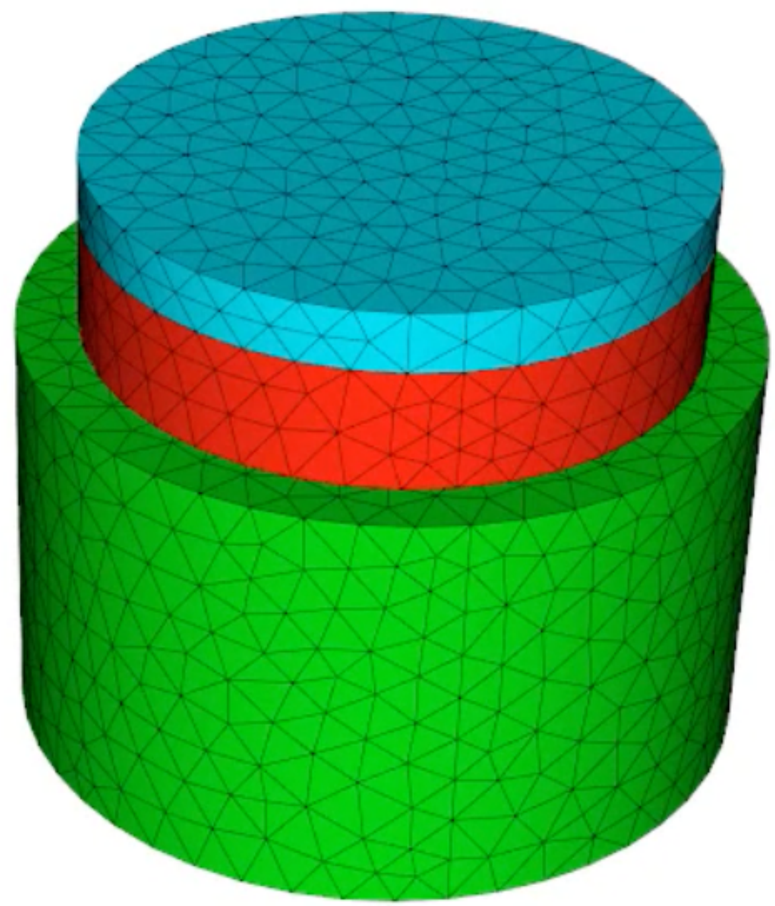
APRS

Location (m)

X 0
Y 0
Z 0

Color

Sample Fil… | Sample Fil… | Sample Fil…



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Model Tree

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- Mat 2
- Drives
  - Drive 1
  - Drive 2
- Axis Definitions
  - Axis 1
- Geometry
  - Part 1
  - Part 2
- Grid
  - Mesh Control Points
    - X Axis
      - Point 1
      - Point 2
    - Y Axis
    - Z Axis
  - Refinement Level
- Loads
  - Load 1
  - Load 2
- Boundaries
  - Bnd 1
  - Bnd 2
- Outputs
  - Output 1
  - Output 2
- Analysis
- Runtime

Model Properties

Output Property

Output Name

Output 1

Output Type

Extrapolation Plane

Cutting Axis

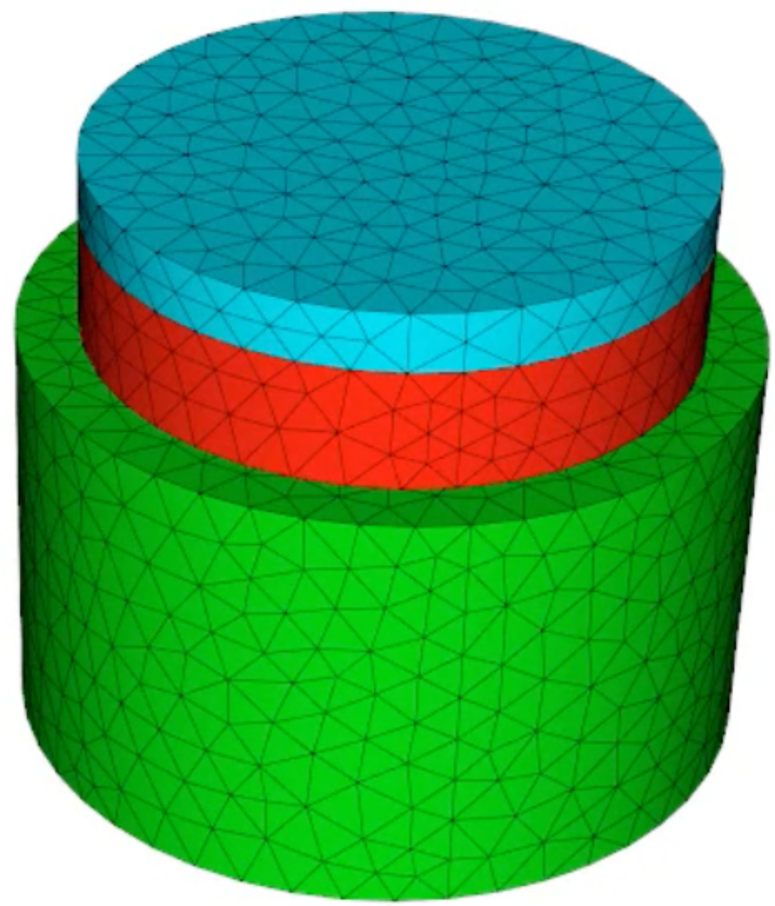
X

Cutting Point (mm)

0.001

Color

Sample Fil… | Sample Fil… | Sample Fil…



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Run | Review

Model Tree

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- Drives
  - Drive 1
  - Drive 2
- Axis Definitions
  - Axis 1
- Geometry
  - Part 1
  - Part 2
- Grid
  - Mesh Control Points
    - X Axis
      - Point 1
      - Point 2
    - Y Axis
    - Z Axis
  - Refinement Level
- Loads
  - Load 1
  - Load 2
- Boundaries
  - Bnd 1
  - Bnd 2
- Outputs
  - Output 1
  - Output 2
- Analysis
- Runtime

Model Properties

Output Property

Output Name

Output 1

Output Type

Extrapolation Plane

Cutting Axis

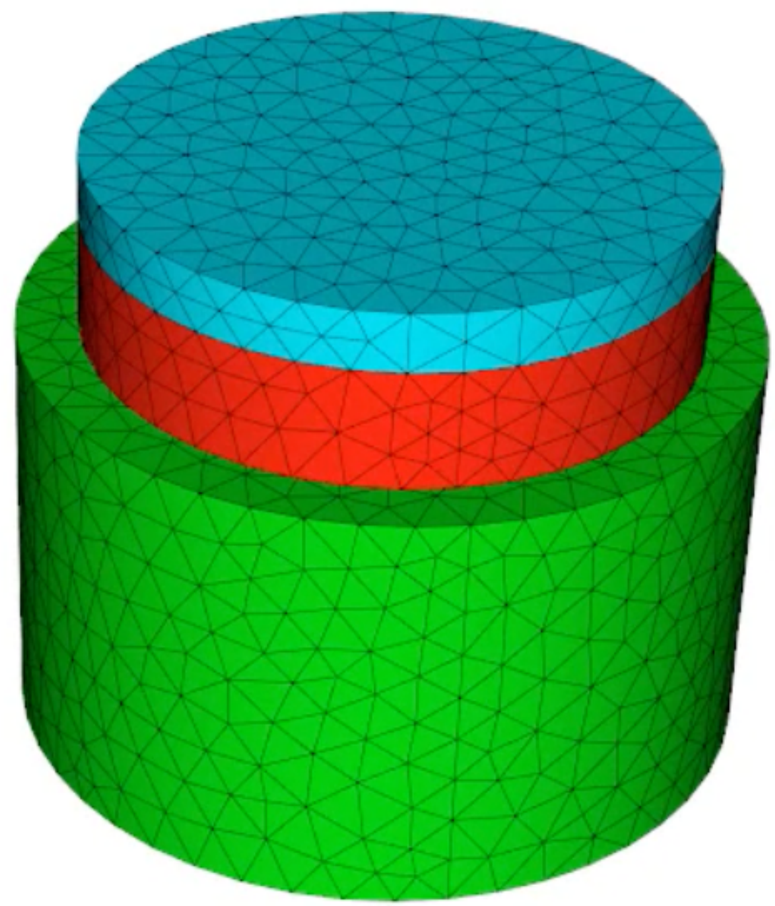
X

Cutting Point (mm)

0.001

Color

Sample Fil… | Sample Fil… | Sample Fil…



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Button

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Axis Tool

Time Function Tool

Batch Controller Tool

Job Scheduler Tool

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View

- Reset View
- Configure View Port
- Button

Shape

- Set Plane
- Rotate Model
- Flip Symmetry

Model

- Show Model Boundries
- Show Model Dimensions
- Show Deformed Model (2D)
- Plot Deformed Displacement
- Animate Plot

Tools

- Measurement Tool
- Cutting Plane Tool
- Data Probe Tool
- Multi Point Data Probe
- Data Spline Tool
- Export Splined Data Tool

Home | Materials | Model Graphics | Tools | Workspace | Help

Project Materials | Add New | Import Global Material(s) | Import Project Material(s) | Export Global Material(s) | Export Project Material(s)

Model Properties

Project Data

Source File

file.step

BDF File

file.bdf

BDF File Node Count

2814

BDF File Element Count

13401

Model Properties

Project Data

Label

1

Label

ABC

Color

Model Properties

Drive Property

Drive Name

Drive 1

Drive Type

Gaussain

Drive Frequency (kHz)

Number of Cycles

1

Amplitude (Pa-p-p)

1.00

Ramp Signal Number of Cycles

0

Model Properties

Axis Property

Axis Name

Axis 1

	Offset (m)	Rotation	Boundary
X	0	90.0	
Y	0	90.0	
Z	0	90.0	

Model Properties

Load Property

Load Name

Load 1

Associated Material

Mat 1

Load Type

Pressure (PLOD)

Associated Drive

Drive 1

Color

Model Properties

Geometry Properties

Geometry Name

Part 1

Assigned Material

Gold

Associated Axis

X

Scale

1.00

Color

Model Properties

Simulation Property

Scaling Factor (Dimensions)

1

Simulation Time (μs)

10

Elements per Wavelength

15

Background Material

VOID

Meshing Velocity

0

Frequency of Interest (kHz)

0

Output File (Flex Input File)

C:\Program Files\WAI\Flex\PZFI…

...

Model Properties

Mesh Control Point

Mesh Control Point Name

Point 1

Associated Axis

X

Control Point (mm)

20

Model Properties

Boundaries Property

Boundary Name

Bnd 1

	Minimum	Maximum
X	SYMM	FREE
Y		
Z		

Model Properties

Display Property

Display Name

Display 1

Plot Type

Array

Array

Acoustic Pressure

Component

APRS

Frames

20

Save Frames As

None

Model Properties

Output Property

Output Name

Output 1

Output Type

Time History

Array

Acoustic Pressure

Component

APRS

Location (m)

X 0

Y 0

Z 0

Color

Model Properties

Output Property

Output Name

Output 1

Output Type

Extrapolation Plane

Cutting Axis

X

Cutting Point (mm)

0.001

Color

Model Properties

Analysis Property

Frequency of Interest

0

Frequency of Dampering

0

Coordinate Conversion Factor

0

Time Conversion Factor

1

Mass Conversion Factor

1

Number of CPU's Requested

1

Mesh Velocity

1

Elements per Wavelength

1

Background Material

VOIC

Model Properties

Output Property

Output Name

Output 1

Output Type

Time History
Maximum
Extrapolation Plane

Component

APRS

Location (m)

X 0

Y 0

Z 0

Color

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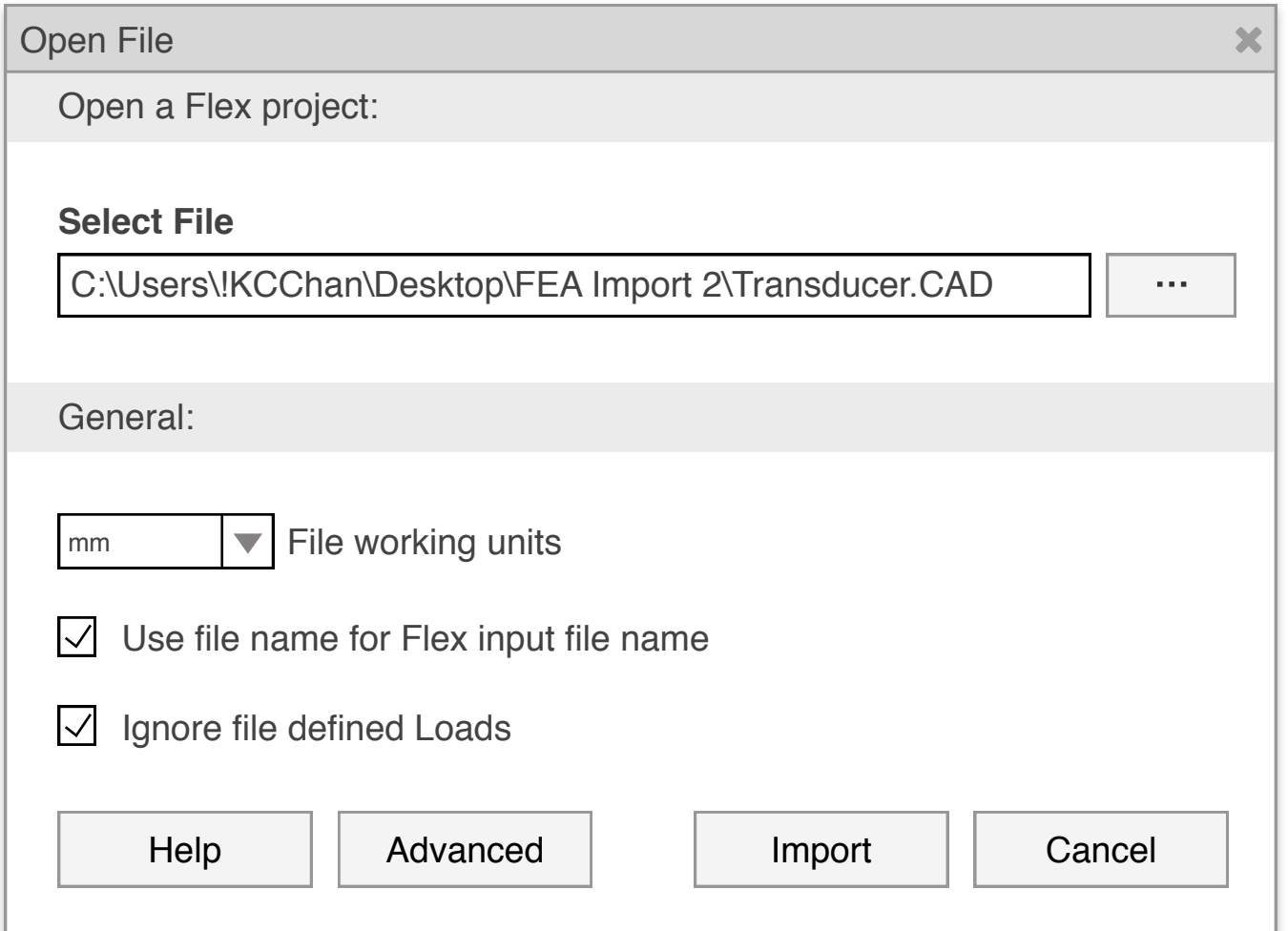
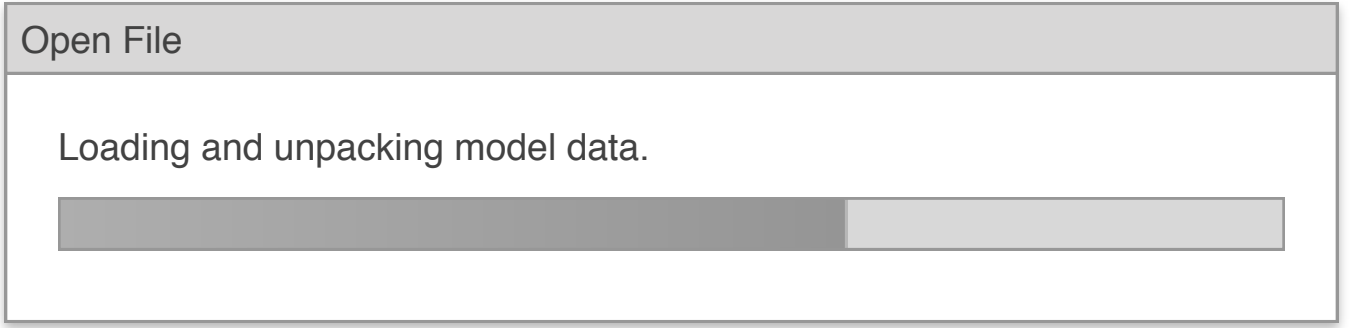
Run Flex | Run Review | Run Build | Kill Run | Button

Run

Print | Settings

Review


Open File
Open a Flex project:
Select File
C:\Users\!KCChan\Desktop\FEA Import 2\Transducer.CAD
...
General:
mm
File working units
Use file name for Flex input file name
Ignore file defined Loads
Help
Advanced
Import
Cancel


Open File
Loading and unpacking model data.

Open File

Open a Flex project:

Select File

C:\Users\!KCChan\Desktop\FEA Import 2\Transducer.CAD ...

General:

mm File working units

☑ Cull lower dimensional elements (Recommended)

☑ Ignore file defined Loads

Meshing Options:

☑ Use input file name for BDF mesh output

☑ Use GMSH default options

0.3000000 Mesher element size factor

Mesh by Curve Meshing options

Help | Basic | Import | Cancel

Model Tree

- Project Data
  - Materials
  - Drives
  - Axis Definitions
- Geometry
- Grid
- Loads
- Boundaries
- Outputs
- Analysis
- Runtime

Model Tree

- Project Data
  - Materials
    - Mat 1
    - Mat 2
  - Drives
  - Axis Definitions
- Geometry
- Grid
- Loads
- Boundaries
- Outputs
- Analysis
- Runtime

Model Tree

- Project Data
  - Materials
    - Mat 1
    - Mat 2
  - Drives
    - Drive 1
    - Drive 2
  - Axis Definitions
- Geometry
- Grid
- Loads
- Boundaries
- Outputs
- Analysis
- Runtime

Model Tree

- Project Data
  - Materials
    - Mat 1
    - Mat 2
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    - Drive 2
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    - Axis 1
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Model Tree

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    - Mesh Control Points
    - Refinement Level
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  - Boundaries
  - Outputs
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    - Y Axis
    - Z Axis
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  - Load 1
  - Load 2
- Boundaries
  - Bnd 1
  - Bnd 2
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  - Output 1
  - Output 2
- Analysis
- Runtime

Define Load Surface

Define Load Surface

Load Name

Load 1

Load Type

Pressure (PLOD)

Associated Drive

Drive 1

Selection Configuration

Surface — Selection Mode

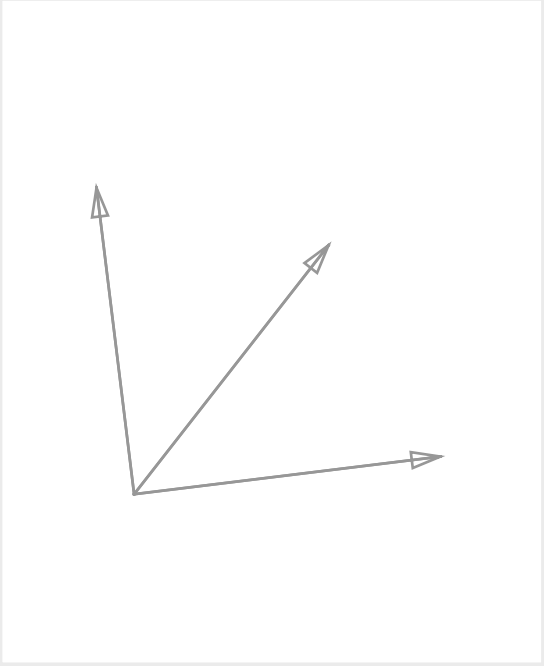
90.0 — Surface Angle (°)

90.0 — Feature Angle (°)

Create Load | Cancel

Define Axis

Define Axis



Drive Name

Axis 1

Axis Definition

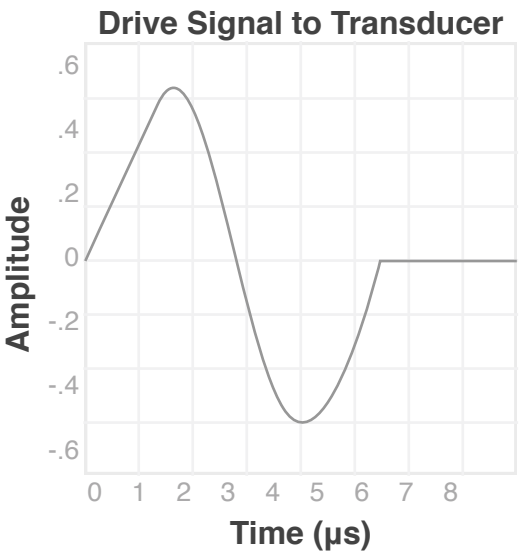
Angular

	Offset (m)	Rotation	Boundary
X	0	90.0	
Y	0	90.0	
Z	0	90.0	

Display | Reset | Save | Cancel

Define Drive

Define Drive



Drive Name

Drive 1

Drive Type

Sinusoid Pulse

Drive Name

1

Number of Cycles

1

Amplitude (Pa-p-p)

1.00

Ramp Signal - Number of Cycles

0

Save Cancel

Define Control Point

Define Control Point

Control Point Name

CP 1

Flex Input:

X

Control Point Location (mm)

Between the values (-25, 25)

Save

Cancel

Define Control Point

Define Control Point

Control Point Name

CP 1

Flex Input:

X

Control Point Location (mm)

Between the values (-25, 25)

Please enter a control point location

Save

Cancel

Define Control Point

Define Control Point

Control Point Name

CP 1

Flex Input:

X

Control Point Location (mm)

Between the values (-25, 25)

Please enter a control point location

20

Save

Cancel

Model Tree

- Project Data
  - Materials
    - Mat 1
    - Mat 2
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Model Tree

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  - Bnd 1
  - Bnd 2
- Outputs
  - Output 1
  - Output 2
- Analysis
- Runtime

Unable to Generate Run

Unable to run model without materials assigned to the workspace.

OK

PZFlex

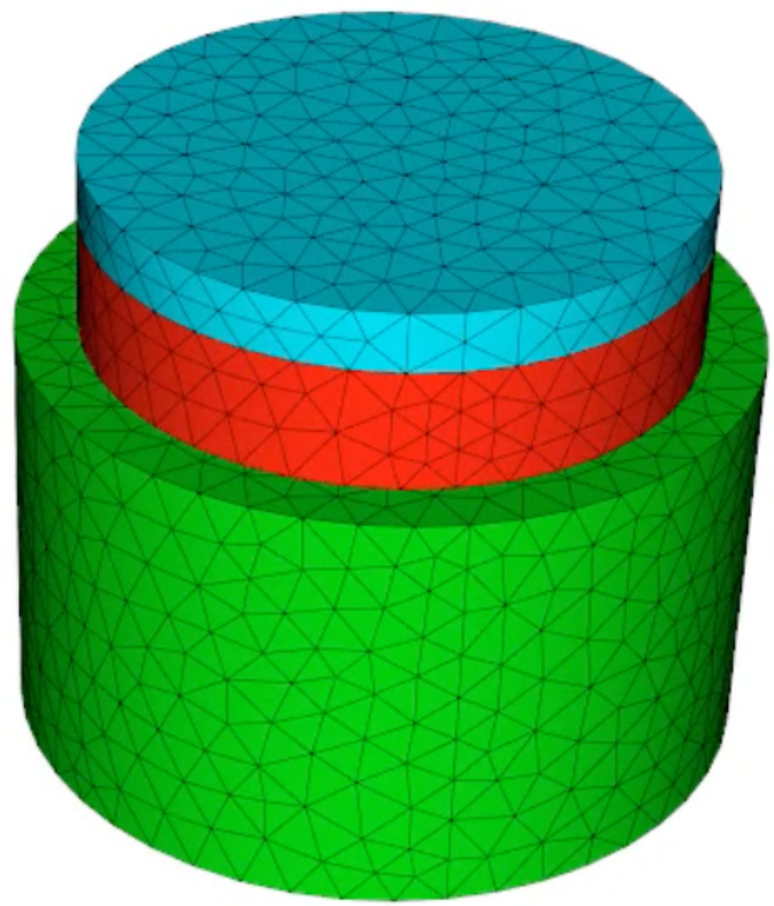
Home | Materials | Model Graphics | Tools | Workspace | Help

File Explorer | Solver Output | Console | Model Tree | Model Properties | Button

Model Tree

- Project Data
  - Materials
  - Drives
  - Axis Definitions
- Geometry
- Grid
- Loads
- Boundaries
- Outputs
- Analysis
- Runtime

Sample Fil… | Sample Fil… | Sample Fil…



PZFlex

Home | Materials | Model Graphics | Tools | Workspace | Help

Run Flex | Run Review | Run Build | Kill Run | Button | Print | Settings

Run | Review

Model Tree

- Project Data
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    - Drive 1
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    - Axis 1
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      - Point 2
    - Y Axis
    - Z Axis
  - Refinement Level
- Loads
- Boundaries
- Outputs
- Analysis
- Runtime

Model Properties

Mesh Control Point

Mesh Control Point Name

Point 1

Associated Axis

X

Control Point (mm)

20

Sample Fil… | Sample Fil… | Sample Fil…

Define Control Point

Define Control Point

Control Point Name

CP 1

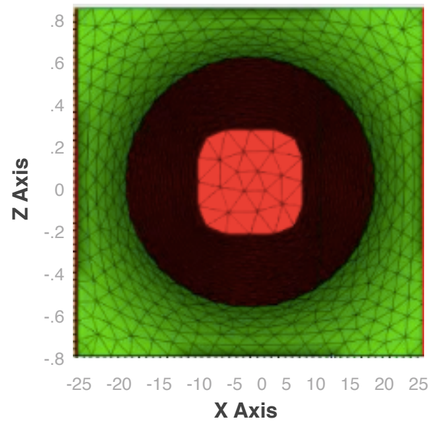
Flex Input:

X

Control Point Location (mm)
Between the values (-25, 25)

20

Save | Cancel



PZFlex

Home | Materials | Model Graphics | Tools | Workspace | Help

Run Flex | Run Review | Run Build | Kill Run | Button | Print | Settings

Run | Review

Model Tree

- Project Data
  - Materials
    - Mat 1
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      - Y Axis
      - Z Axis
    - Refinement Level
  - Loads
  - Boundaries
  - Outputs
  - Analysis
  - Runtime

Model Properties

Project Data

Sample Fil… | Sample Fil… | Sample Fil…

Define Control Point

Define Control Point

Control Point Name

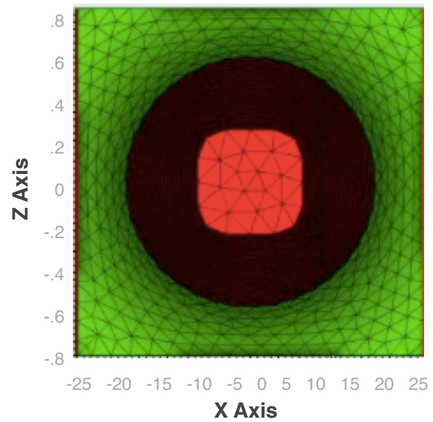
CP 1

Flex Input:

X

Control Point Location (mm)
Between the values (-25, 25)

Save | Cancel



PZFlex

Home | Materials | Model Graphics | Tools | Workspace | Help

Run Flex | Run Review | Run Build | Kill Run | Button | Print | Settings

Run | Review

Model Tree

- Project Data
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Model Properties

Project Data

Sample Fil… | Sample Fil… | Sample Fil…

Define Control Point

Define Control Point

Control Point Name

CP 1

Flex Input:

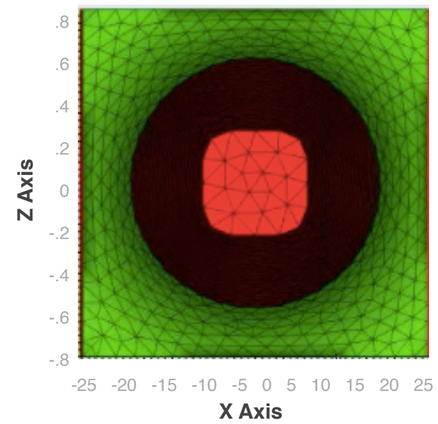
X

Control Point Location (mm)

Between the values (-25, 25)

Please enter a control point location

Save | Cancel



PZFlex

Home | Materials | Tools | Workspace | Help

Undo | Redo | Cut | Copy | Paste
Edit

Font | 11
Font

Toggle/Fold Code | Comment | Uncomment
Fold

Find | Replace | Find in Files | Find Previous | Find Next
Find

Run | Run Flex | Run Review | Run Build | Run Standalone | Stop Simulations | Kill Run
Run

Print | Settings
Settings

File Explorer

- Windows 10 (C:)
  - Folder
  - Folder
    - File
    - File
- D:

Symbol Properties

	Name	Type	Value
1			
2			
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4			
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18			
19			
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Debug

1
2
3
4
5
6
7

Console

p>

PZFlex

Home | Materials | Tools | Workspace | Help

File Explorer | Symbol Properties | Data Manager | Solver Output | Console | Debug | Graphics | Button

File Explorer

- Windows 10 (C:)
  - Folder
  - Folder
    - File
    - File
- D:

Symbol Properties

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Debug

1
2
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7

Console

p>

PZFlex

Home | Materials | Tools | Workspace | Help

Undo | Redo | Cut | Copy | Paste | Font | 11 | Toggle/Fold Code | Comment | Uncomment | Find | Replace | Find in Files | Find Previous | Find Next | Run | Run Flex | Run Review | Run Build | Run Standalone | Stop Simulations | Kill Run | Print | Settings

Edit | Font | Fold | Find | Run | Settings

File Explorer

- Windows 10 (C:)
  - Folder
  - Folder
    - File
    - File
- D:

Symbol Properties

	Name	Type	Value
1	side_len	float	0.01
2	x1	float	0
3	x2	float	0.01
4	y1	float	0
5	y2	float	0.01
6	z1	float	1e+06
7	z2	float	3200
8	feqint	float	0.0032
9	velmin	float	0.0032
10	wavemin	float	1.04
11	nelen	float	0.231
12	box	integer	1
13	i1	integer	32
14	i2	integer	32
15	indard	integer	14
16			
17			
18			
19			
20			

Sample Fil... | Sample Fil... | Sample Fil...

```
C AREA OF A TRIANGLE - HERON'S FORMULA
C INPUT - CARD READER UNIT 5, INTEGER INPUT, NO BLANK CARD FOR END OF DATA
C OUTPUT - LINE PRINTER UNIT 6, REAL OUTPUT
C INPUT ERROR DISPAYS ERROR MESSAGE ON OUTPUT
  501 FORMAT(3I5)
  601 FORMAT(" A= ",I5,"  B= ",I5,"  C= ",I5,"  AREA= ",F10.2,
     $"SQUARE UNITS")
  602 FORMAT("NORMAL END")
  603 FORMAT("INPUT ERROR OR ZERO VALUE ERROR")
      INTEGER A,B,C
   10 READ(5,501,END=50,ERR=90) A,B,C
      IF(A=0 .OR. B=0 .OR. C=0) GO TO 90
      S = (A + B + C) / 2.0
      AREA = SQRT( S * (S - A) * (S - B) * (S - C) )
      WRITE(6,601) A,B,C,AREA
      GO TO 10
   50 WRITE(6,602)
      STOP
   90 WRITE(6,603)
      STOP
```

Debug

Console

p>

PZFlex

Home | Materials | Tools | Workspace | Help

Materials | Add New | Import Global Material(s) | Import Project Material(s) | Export Global Material(s) | Export Project Material(s)

File Explorer

- Windows 10 (C:)
  - Folder
  - Folder
    - File
    - File
- D:

Symbol Properties

	Name	Type	Value
1	side_len	float	0.01
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3	x2	float	0.01
4	y1	float	0
5	y2	float	0.01
6	z1	float	1e+06
7	z2	float	3200
8	feqint	float	0.0032
9	velmin	float	0.0032
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Sample Fil... | Sample Fil... | Sample Fil...

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      S = (A + B + C) / 2.0
      AREA = SQRT( S * (S - A) * (S - B) * (S - C) )
      WRITE(6,601) A,B,C,AREA
      GO TO 10
   50 WRITE(6,602)
      STOP
   90 WRITE(6,603)
      STOP
```

Debug

Console

p>

PZFlex

Home | Materials | Tools | Workspace | Help

File Explorer | Symbol Properties | Data Manager | Solver Output | Console | Debug | Graphics | Button

File Explorer

- Windows 10 (C:)
  - Folder
  - Folder
    - File
    - File
- D:

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Debug

Console

p>

PZFlex

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File Explorer | Symbol Properties | Data Manager | Solver Output | Console | Debug | Graphics | Button

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12	box	integer	1
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15	indard	integer	14
16			
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Data Manager

	Name	Type	Value
1			
2			
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Sample Fil… | Sample Fil… | Sample Fil…

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      STOP
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Debug

Console

p>

PZFlex

Home | Materials | Tools | Workspace | Help

File Explorer | Symbol Properties | Data Manager | Solver Output | Console | Debug | Graphics | Button

File Explorer

- Windows 10 (C:)
  - Folder
  - Folder
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- D:

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Sample Fil… | Sample Fil… | Sample Fil…

```
C AREA OF A TRIANGLE - HERON'S FORMULA
C INPUT - CARD READER UNIT 5, INTEGER INPUT, NO BLANK CARD FOR END OF DATA
C OUTPUT - LINE PRINTER UNIT 6, REAL OUTPUT
C INPUT ERROR DISPAYS ERROR MESSAGE ON OUTPUT
  501 FORMAT(3I5)
  601 FORMAT(" A= ",I5,"  B= ",I5,"  C= ",I5,"  AREA= ",F10.2,
     $"SQUARE UNITS")
  602 FORMAT("NORMAL END")
  603 FORMAT("INPUT ERROR OR ZERO VALUE ERROR")
      INTEGER A,B,C
   10 READ(5,501,END=50,ERR=90) A,B,C
      IF(A=0 .OR. B=0 .OR. C=0) GO TO 90
      S = (A + B + C) / 2.0
      AREA = SQRT( S * (S - A) * (S - B) * (S - C) )
      WRITE(6,601) A,B,C,AREA
      GO TO 10
   50 WRITE(6,602)
      STOP
   90 WRITE(6,603)
      STOP
```

Console

p>

PZFlex

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File Explorer Symbol Properties Data Manager Solver Output Console Debug Graphics Button

File Explorer

- Windows 10 (C:)
  - Folder
  - Folder
    - File
    - File
- D:

Sample Fil… Sample Fil… Sample Fil…

```
C AREA OF A TRIANGLE - HERON'S FORMULA
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      STOP
   90 WRITE(6,603)
      STOP
```

Debug

Console

p>

PZFlex

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Axis Tool | Time Function | Mode Shape | SITE | Batch Controls | Job Scheduler | Circuit Definition | Output Definition

File Explorer

- Windows 10 (C:)
  - Folder
  - Folder
    - File
    - File
- D:

Symbol Properties

	Name	Type	Value
1	side_len	float	0.01
2	x1	float	0
3	x2	float	0.01
4	y1	float	0
5	y2	float	0.01
6	z1	float	1e+06
7	z2	float	3200
8	feqint	float	0.0032
9	velmin	float	0.0032
10	wavemin	float	1.04
11	nelen	float	0.231
12	box	integer	1
13	i1	integer	32
14	i2	integer	32
15	indard	integer	14
16			
17			
18			
19			
20			

Sample Fil… | Sample Fil… | Sample Fil…

```
C AREA OF A TRIANGLE - HERON'S FORMULA
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   90 WRITE(6,603)
      STOP
```

Debug

Console

p>

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File Explorer

- Windows 10 (C:)
  - Folder
  - Folder
    - File
    - File
- D:

Symbol Properties

	Name	Type	Value
1	side_len	float	0.01
2	x1	float	0
3	x2	float	0.01
4	y1	float	0
5	y2	float	0.01
6	z1	float	1e+06
7	z2	float	3200
8	feqint	float	0.0032
9	velmin	float	0.0032
10	wavemin	float	1.04
11	nelen	float	0.231
12	box	integer	1
13	i1	integer	32
14	i2	integer	32
15	indard	integer	14
16			
17			
18			
19			
20			

Sample Fil… | Sample Fil… | Sample Fil…

```
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      WRITE(6,601) A,B,C,AREA
      GO TO 10
   50 WRITE(6,602)
      STOP
   90 WRITE(6,603)
      STOP
```

Debug

Console

p>

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Button

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Axis Tool

Time Function

Mode Shape

SITE

Batch Controls

Job Scheduler

Circuit Definition

Output Definition

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Materials | Add New | Import Global Material(s) | Import Project Material(s) | Export Global Material(s) | Export Project Material(s)

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Undo
Redo
Cut
Copy
Paste
Edit

Font
11
Font

Toggle/Fold Code
Comment
Uncomment
Fold

Find
Replace
Find in Files
Find Previous
Find Next
Find

Run
Run Flex
Run Review
Run Build
Run Standalone
Stop Simulations
Kill Run
Run

Print
Settings
Settings

Configuration Settings

- 2D Model Building
- 3D Insight
- Characterization
- Extrapolation
- FEA Import
- Flex Lab General
- Flex Executable
- Flex File
- Insight Settings
- MediFlex
- Mode Shape
- Wizard

FEA Import Toolkit Settings

	Materials	Loads
	○	○
	○	●
	○	○
	●	○

CPU Settings

Number of CPUs used in Flex Runs

4

Model Visualization

Model Geometry Units

mm

Frequency Units

kHz

Time Units

µs

Save Cancel

Revision Control

Compare with: 2: 02/14/2017 14:15:10

Revision 2: 02/14/2017 14:15:10

```
1  /* Thickness
2  symb thk_back = 2.0e-3
3  symb thk_comp = 1.0e-3
4  symb thk_m1 = 0.1e-3
5  symb thk_m2 = 0.1e-3
6  symb thk_load = 1.5e-3
7
8  /* Widths
9  symb wdth_kerf = 0.15e-3
10 symb wdth_pitch = 0.40e-3
11 symb wdth_side = 0.1e-3
12
13 /* Array
14 symb npillx =
15
```

C:\\MyDirectory\\MyFile

```
1  /* Thickness
2  symb thk_back = 2.0e-3
3  symb thk_comp = 1.0e-3
4  symb thk_m1 = 0.1e-3
5  symb thk_m2 = 0.1e-3
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12
13 /* Array
14 symb npillx =
15
```

Revert | Revert All | Update | Cancel

Materials Database

Integer posuere erat a ante venenatis dapibus posuere velit aliquet. Nulla vitae elit libero, a pharetra augue. Praesent commodo cursus magna, vel scelerisque nisl consectetur et.

Global Materials

Description	Name
Piezoelectric	
Ferroperm PZ21	fpz21
Ferroperm PZ26…	fpz26
Ferroperm PZ27…	fpz27
Ferroperm PZ28…	fpz28
Ferroperm PZ29…	fpz29
Mechanical P…	
Density	7460
Constants	stif
c11	1.34e+11
c12	8.97e+10
c13	8.57e+10
c14	0

Project Materials

Property	Value	Units

Show Full Properties List

Save Cancel

Materials Database

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Project Materials

Property	Value	Units

Show Full Properties List

Save Cancel

Revision Control

Compare with: 2: 02/14/2017 14:15:10

Revision 2: 02/14/2017 14:15:10

```
21 symb #get { step } timestep
22 symb simtime = 100 / $freqint /* 100
23 cycles to allow charge to ringdown
24 symb nexec = nint ( $simtime / $step
25 symb nloops = 50
26 symb nexec_loop = nint ( $nexec /
27 $nloops )
28
29 proc plot save
30 exec $nexec_loop
31
32 grph
33     nvew 1
34     plot 3 /* Plot charge (q) on top
35 electrode - dictates ringdown time
```

C:\\MyDirectory\\MyFile

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21 symb #get { step } timestep
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Mechanical P…	
Density	7460
Constants	stif
c11	1.34e+11
c12	8.97e+10
c13	8.57e+10
c14	0

Project Materials

Property	Value	Units
gold		
Acoustic…		
Density	**8590**	kgm-3
Values	Velocity	
Bulk…	3240	ms-1
Shear…	1200	ms-1
Damping…		
Type	Visco…	
Bulk	0.4	dB/MH..
Shear…	1.6	dB/MH..
Bulk P…	1	
Shear…	1	
Thermal…		

Show Full Properties List

Save Cancel

Materials Database

Integer posuere erat a ante venenatis dapibus posuere velit aliquet. Nulla vitae elit libero, a pharetra augue. Praesent commodo cursus magna, vel scelerisque nisl consectetur et.

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Ferroperm PZ28…	fpz28
Ferroperm PZ29…	fpz29
Mechanical P…	
Density	7460
Constants	stif
c11	1.34e+11
c12	8.97e+10
c13	8.57e+10
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Property	Value	Units
gold		
Acoustic…		
Density	7460	kgm-3
Values	Velocity	
Bulk…	3240	ms-1
Shear…	1200	ms-1
Damping…		
Type	Visco…	
Bulk	0.4	dB/MH..
Shear…	1.2	dB/MH..
Bulk P…	1	
Shear…	1	
Thermal…		

Show Full Properties List

Save Cancel

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C:\\MyDirectory\\MyFile

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Density	8590
Constants	stif
c11	1.34e+11
c12	8.97e+10
c13	8.57e+10
c14	0

Project Materials

Property	Value	Units
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Acoustic…		
Density	8590	kgm-3
Values	Velocity	
Bulk…	3240	ms-1
Shear…	1200	ms-1
Damping…		
Type	Visco…	
Bulk	0.4	dB/MH..
Shear…	1.2	dB/MH..
Bulk P…	1	
Shear…	1	
Thermal…		

Show Full Properties List

Save Cancel

PZFlex

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Button Button Button

Data Tree

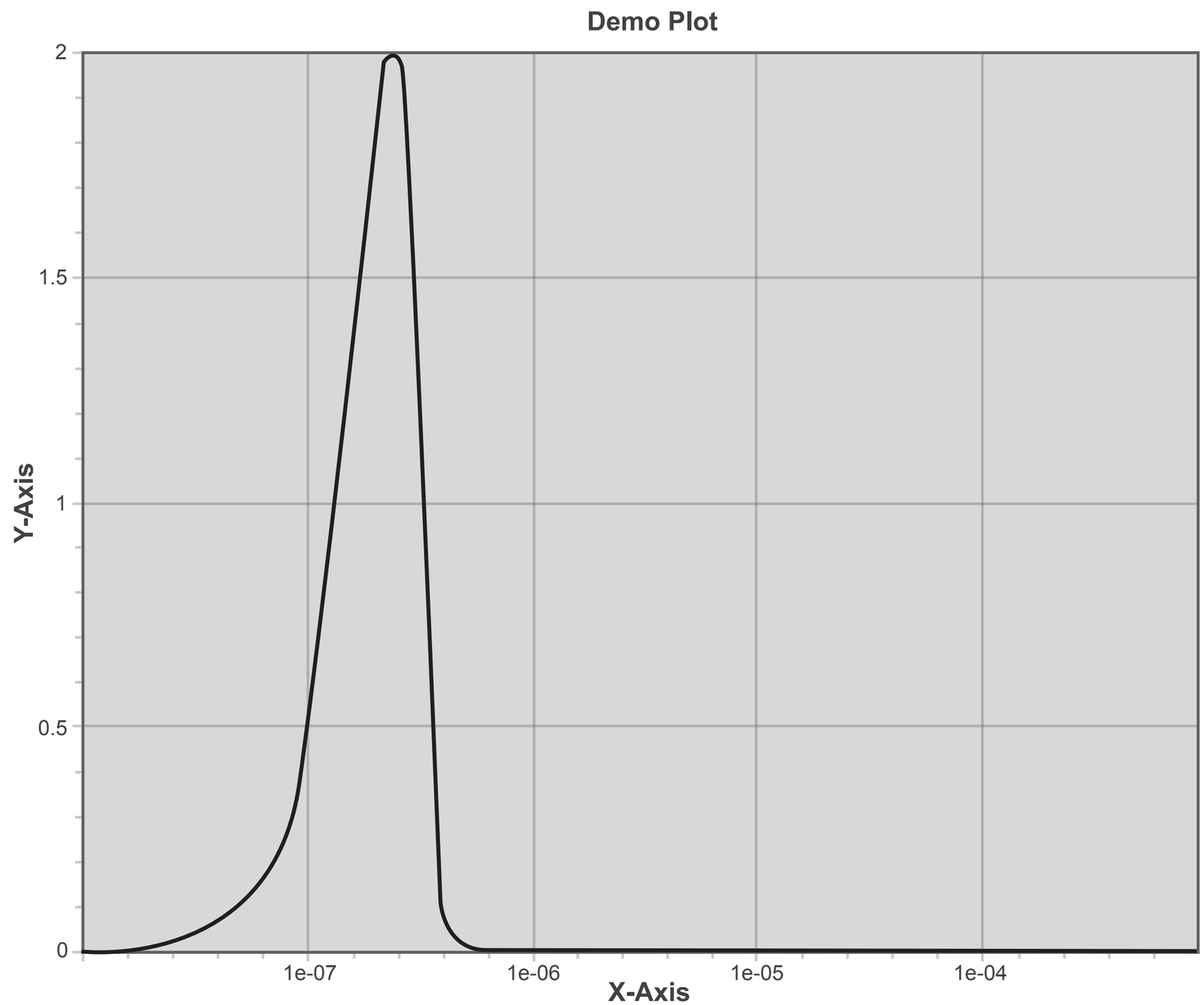
- Flex History
  - File 1
    - XVel 1
    - XVel 2
  - File 2
- Data Out
  - File 1
    - X Velocity
    - Y Velocity
- User Data
  - Vect 1
  - Vect 2
  - Vect-TH 3

Data Properties

Flex History

Property	Value
Units	mm / μs
Min	-0.999998
Max	0.99999
[I, J, K]	
I	501.0
J	1.0
K	1.0
[X, Y, Z]	
X	0.035
Y	0.0
Z	0.0

Sample Fil…



PZFlex

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Button Button Button

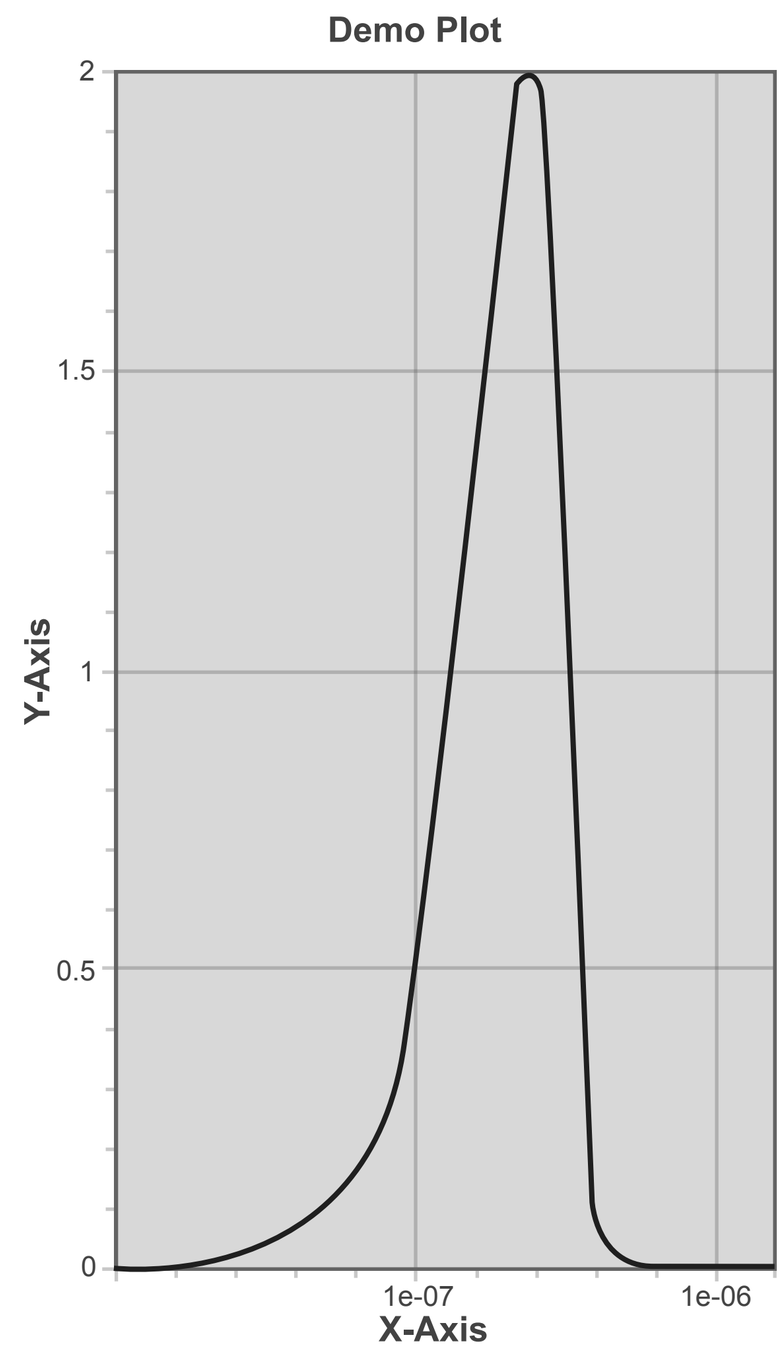
Data Tree

- Flex History
  - File 1
    - XVel 1
    - XVel 2
  - File 2
- Data Out
  - File 1
    - X Velocity
    - Y Velocity
- User Data
  - Vect 1
  - Vect 2
  - Vect-TH 3

Data Properties

Property	Value
Name	XVel 1
Type	Frequency
Units	mHz
Min	-0.999998
Max	0.99999
[I, J, K]	
I	501.0
J	1.0
K	1.0
[X, Y, Z]	
X	0.035
Y	0.0
Z	0.0

Sample Fil…



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Button Button Button

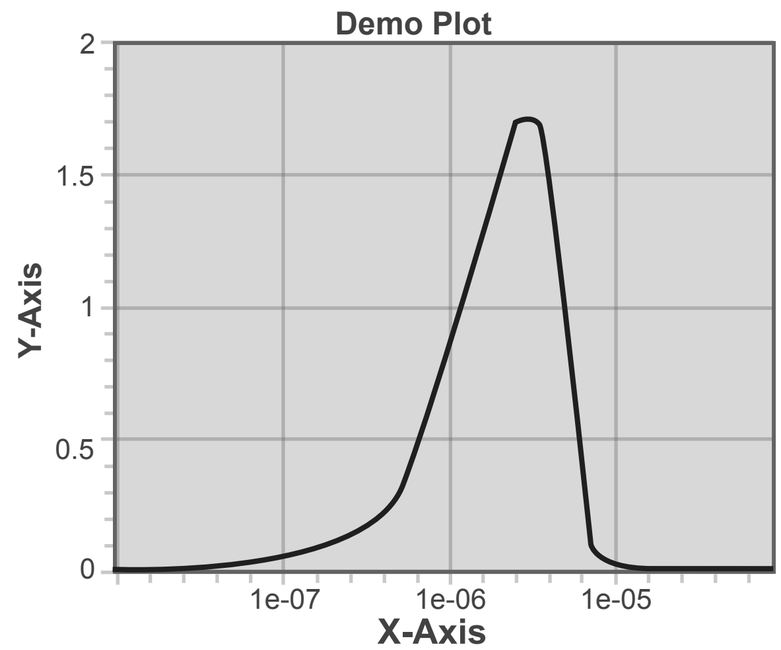
Data Tree

- Flex History
  - File 1
    - XVel 1
    - XVel 2
  - File 2
- Data Out
  - File 1
    - X Velocity
    - Y Velocity
- User Data
  - Vect 1
  - Vect 2
  - Vect-TH 3

Data Properties

Property	Value
Name	XVel 1
Type	Frequency
Units	mHz
Min	-0.999998
Max	0.99999
[I, J, K]	
I	501.0
J	1.0
K	1.0
[X, Y, Z]	
X	0.035
Y	0.0
Z	0.0

Sample Fil…



Curve

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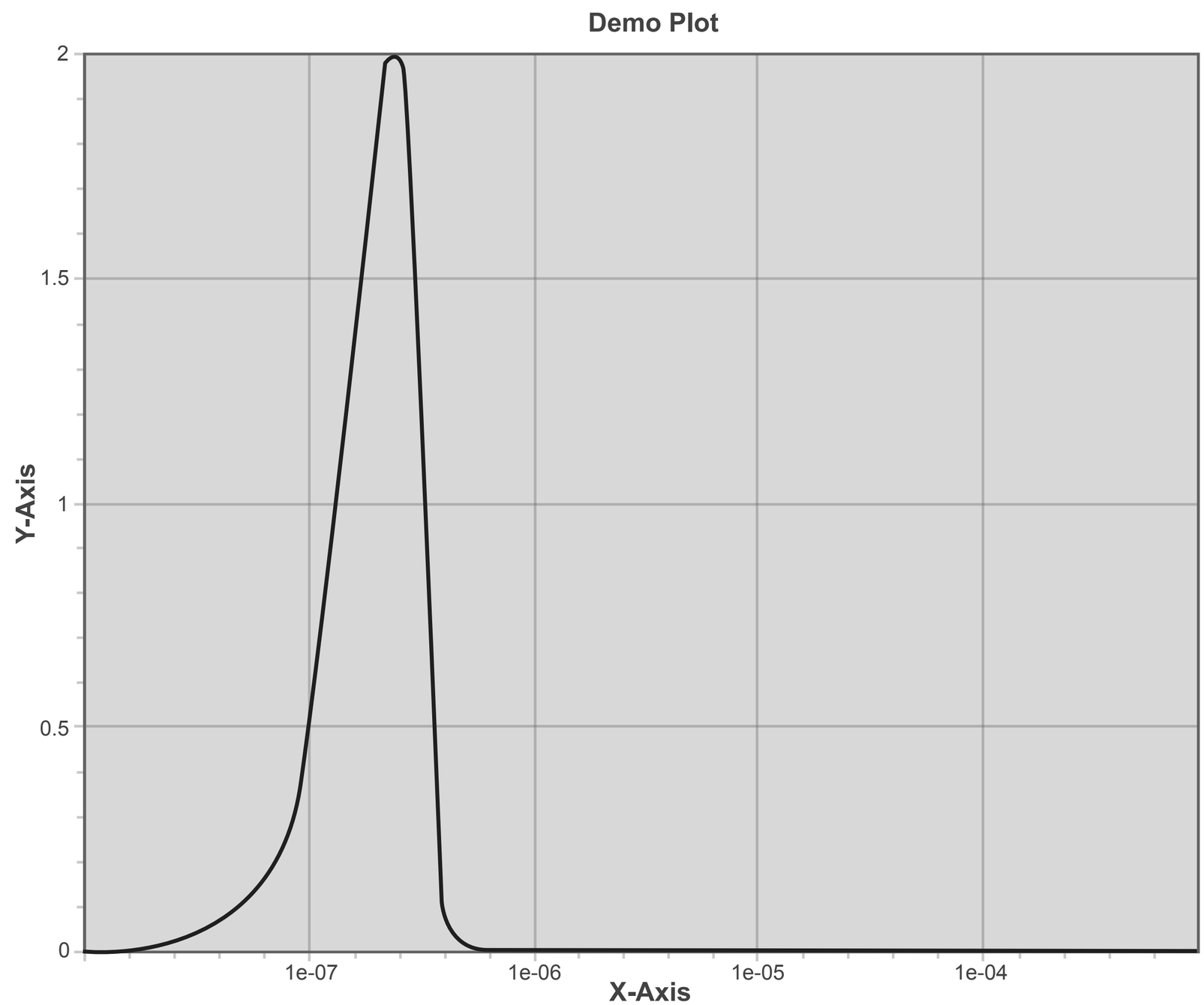
Button Button Button

Data Tree

- Flex History
  - File 1
    - XVel 1
    - XVel 2
  - File 2
- Data Out
  - File 1
    - X Velocity
    - Y Velocity
- User Data
  - Vect 1
  - Vect 2
  - Vect-TH 3

Sample Fil…



Curve

Graph Controls

Navigation Controls

	Minimum	Maximum	
X	-1	1	☑ Logarithmic
Y	-1	1	☑ Logarithmic

Marker

Marker Type

Horizontal

	Marker 1	Marker 2	Difference
X	.5		.5

PZFlex

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Button Button Button

Data Tree

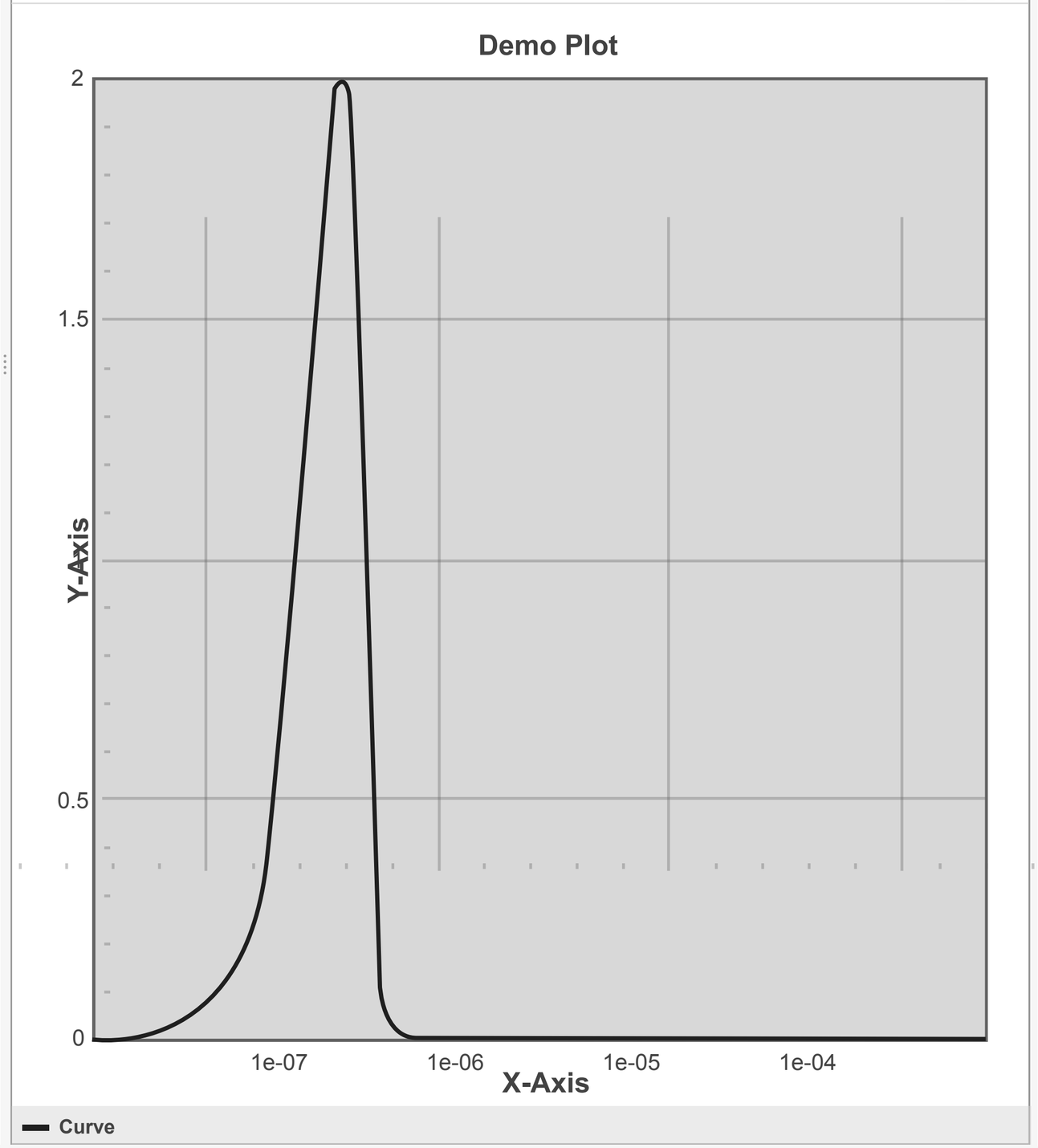
- Flex History
  - File 1
    - XVel 1
    - XVel 2
  - File 2
- Data Out
  - File 1
    - X Velocity
    - Y Velocity
- User Data
  - Vect 1
  - Vect 2
  - Vect-TH 3

Data Properties

Flex History

Property	Value
Units	mm / µs
Min	-0.999998
Max	0.99999
[I, J, K]	
I	501.0
J	1.0
K	1.0
[X, Y, Z]	
X	0.035
Y	0.0
Z	0.0

Sample Fil…



Graph Controls

Navigation Controls

	Minimum	Maximum	
X	-1	1	Logarithmic
Y	-1	1	Logarithmic

Marker

Marker Type: Crosshair

	Marker 1	Marker 2	Difference
X	.5		.5
Y	.5		.5

PZFlex

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Button Button Button

Data Tree

- Flex History
  - File 1
    - XVel 1
    - XVel 2
  - File 2
- Data Out
  - File 1
    - X Velocity
    - Y Velocity
- User Data
  - Vect 1
  - Vect 2
  - Vect-TH 3

Data Properties

Flex History

Property	Value
Units	mm / µs
Min	-0.999998
Max	0.99999
[I, J, K]	
I	501.0
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[X, Y, Z]	
X	0.035
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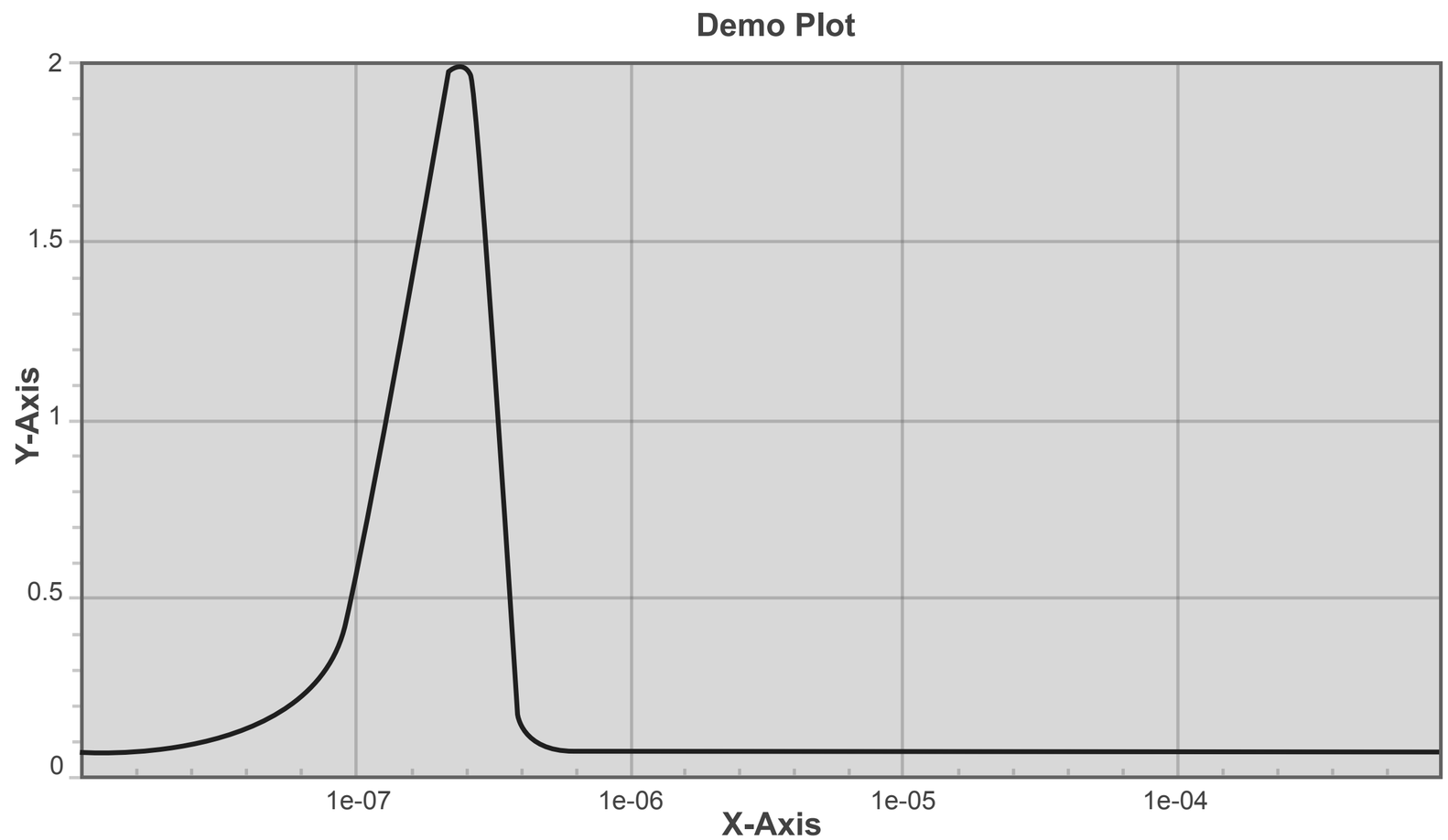
Sample Fil…



Graph Controls

Navigation Controls

	Minimum	Maximum	
X	-1	1	☑ Logarithmic
Y	-1	1	☑ Logarithmic

Marker

Marker Type: Crosshair

	Marker 1	Marker 2	Difference
X	.5		.5
Y	.5		.5