

Acoustic Dispersion

Date	Jul 4, 2013 2:03:05 PM
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1 Global Definitions

1.1 Parameters 1

Parameters

Name	Expression	Description
kx	0	Wave vector shift
L	1[m]	Unit cell length
N	50	Number of parameter values

2 Model 1 (mod1)

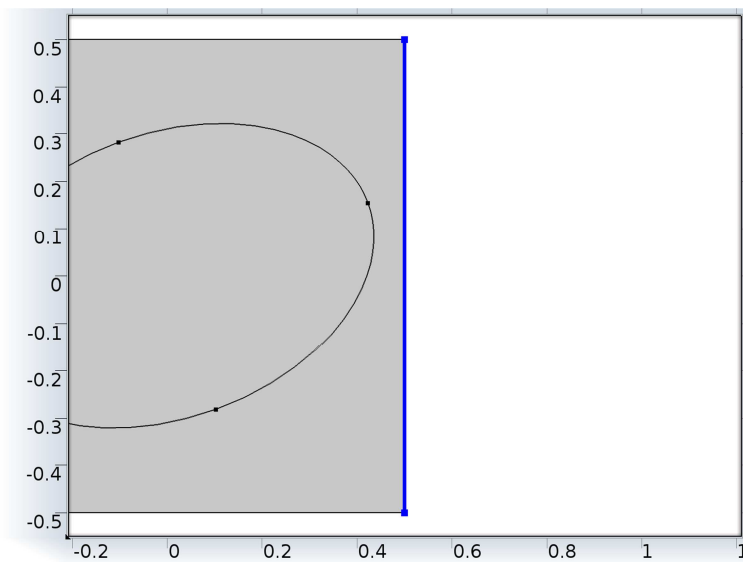
2.1 Definitions

2.1.1 Selections

Explicit 1

Selection type
Explicit

Selection
Boundary 4



Explicit 1

2.1.2 Coordinate Systems

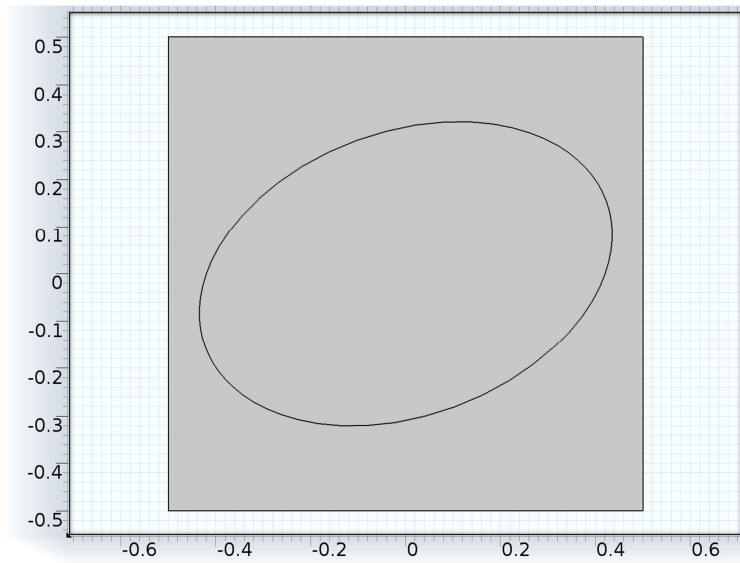
Boundary System 1

Coordinate system type	Boundary system
Identifier	sys1

Settings

Name	Value
Coordinate names	{t1, n, to}
Create first tangent direction from	Global Cartesian

2.2 Geometry 1



Geometry 1

Units

Length unit	m
Angular unit	deg

Geometry statistics

Property	Value
Space dimension	2
Number of domains	2
Number of boundaries	8

2.2.1 Square 1 (sq1)

Position

Name	Value
Position	{0, 0}
Base	Center
Side length	L
Side length	L

2.2.2 Ellipse 1 (e1)

Position

Name	Value
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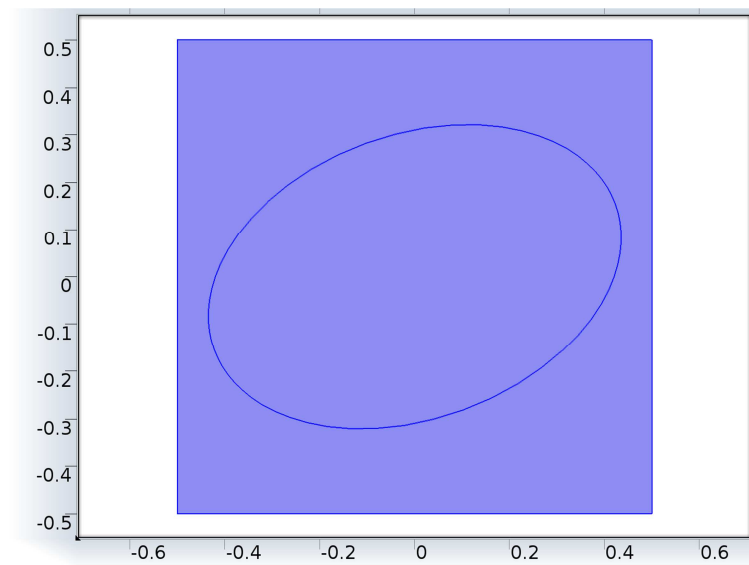
Name	Value
Position	{0, 0}
a-semiaxis	0.45
b-semiaxis	0.3
Semiaxes	{0.45, 0.3}

Rotation angle

Name	Value
Rotation	20

2.3 Materials

2.3.1 Air



Air

Selection

Geometric entity level	Domain
Selection	Domains 1–2

Material parameters

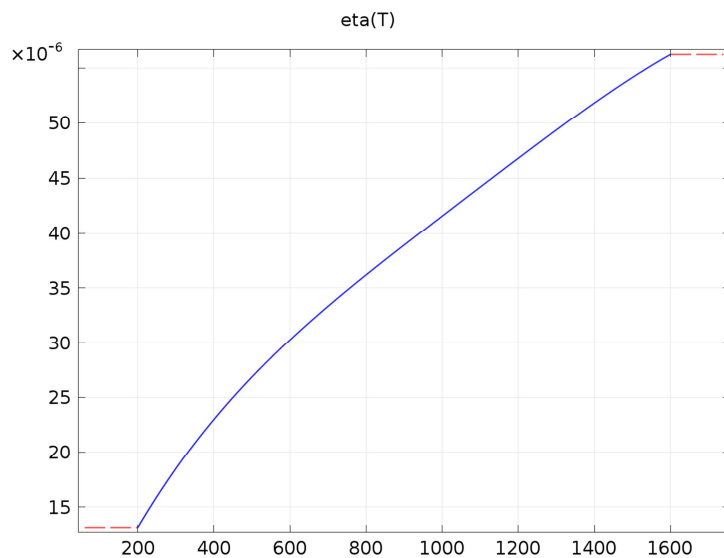
Name	Value	Unit
Density	$\rho(\rho_A[1/\text{Pa}], T[1/\text{K}])[\text{kg}/\text{m}^3]$	kg/m^3
Speed of sound	$c_s(T[1/\text{K}])[\text{m}/\text{s}]$	m/s

Basic Settings

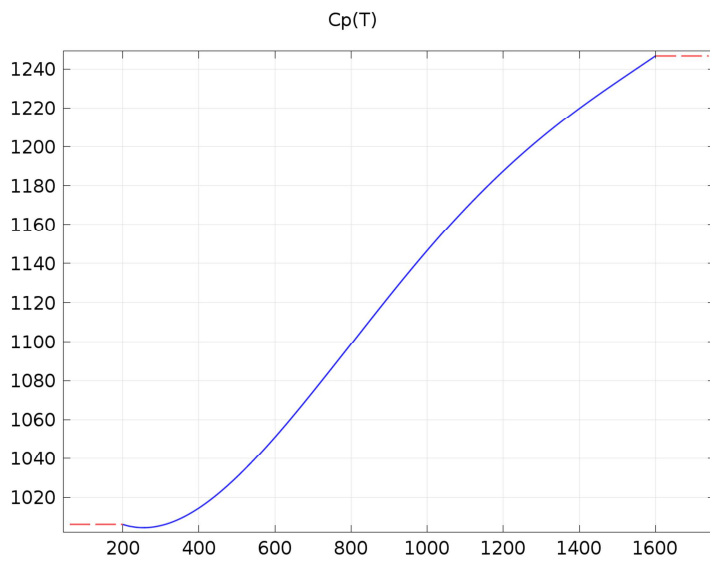
Description	Value
Relative permeability	{{1, 0, 0}, {0, 1, 0}, {0, 0, 1}}
Relative permittivity	{{1, 0, 0}, {0, 1, 0}, {0, 0, 1}}
Dynamic viscosity	eta(T[1/K])[Pa*s]
Ratio of specific heats	1.4
Electrical conductivity	{{0[S/m], 0, 0}, {0, 0[S/m], 0}, {0, 0, 0[S/m]}}
Heat capacity at constant pressure	Cp(T[1/K])[J/(kg*K)]
Density	rho(pA[1/Pa], T[1/K])[kg/m^3]
Thermal conductivity	{{k(T[1/K])[W/(m*K)], 0, 0}, {0, k(T[1/K])[W/(m*K)], 0}, {0, 0, k(T[1/K])[W/(m*K)]}}
Speed of sound	cs(T[1/K])[m/s]

Functions

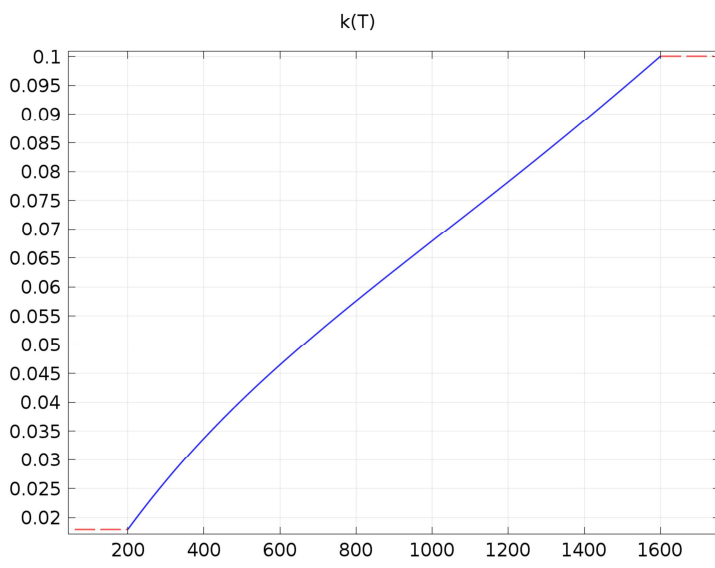
Function name	Type
eta	Piecewise
Cp	Piecewise
rho	Analytic
k	Piecewise
cs	Analytic



eta

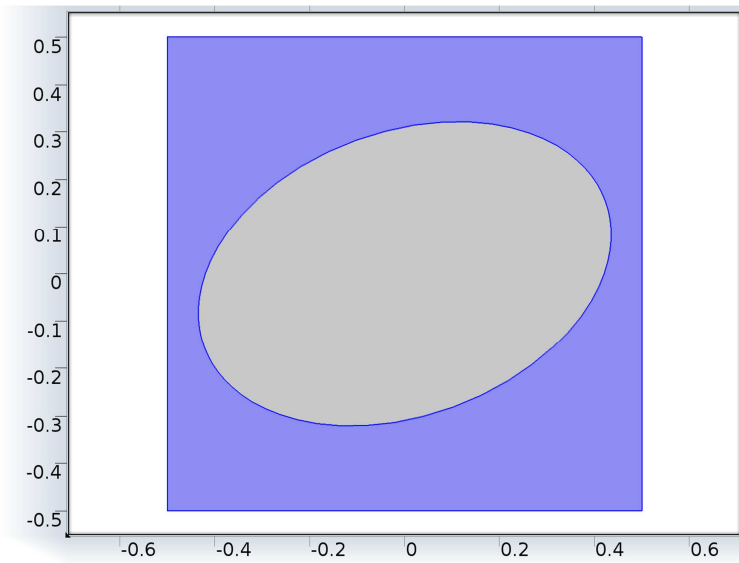


C_p



k

2.4 Pressure Acoustics, Frequency Domain (acpr)



Pressure Acoustics, Frequency Domain

Selection

Geometric entity level	Domain
Selection	Domain 1

Equations

Settings

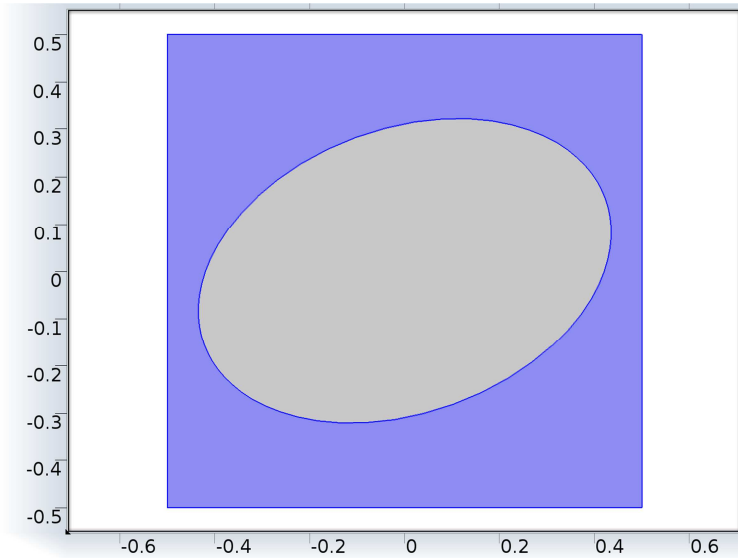
Description	Value
Value type when using splitting of complex variables	Complex
Element order	Quadratic
Equation form	Study controlled
Frequency	100[Hz]
Mode analysis frequency	100[Hz]
Scaling factor	$1/acpr.\omega^2$
Out-of-plane wave number	0
Reference pressure for the sound pressure level	Use reference pressure for air
Typical wave speed for perfectly matched layers	343[m/s]
Show equation assuming	std1/eig

Used products

COMSOL Multiphysics

Acoustics Module

2.4.1 Pressure Acoustics Model 1



Pressure Acoustics Model 1

Selection

Geometric entity level	Domain
Selection	Domain 1

Equations

$$\nabla \cdot \frac{1}{\rho_c} (\nabla p_t - \mathbf{q}_d) - \frac{k_{eq}^2 p_t}{\rho_c} = Q_m$$

$$p_t = p + p_b$$

$$k_{eq}^2 = \left(\frac{\omega}{c_c}\right)^2 - k_z^2$$

$$c_c = c, \quad \rho_c = \rho$$

Settings

Settings

Description	Value
Density	From material
Speed of sound	From material
Ratio of specific heats	1
Fluid model	Linear elastic

Description	Value
Specify	Density and speed of sound
Viscous characteristic length	$\sqrt{\text{acpr.mu} * \text{acpr.tau} * 8 / (\text{acpr.Rf} * \text{acpr.epsilon}_p)}$

Used products

COMSOL Multiphysics

Properties from material

Property	Material	Property group
Density	Air	Basic
Speed of sound	Air	Basic

Variables

Name	Expression	Unit	Description	Selection
acpr.p_s	acpr.p_t-acpr.p_b	Pa	Scattered pressure field	Domain 1
acpr.Lp_s	$10 * \log_{10}(0.5 * \text{acpr.p}_s * \text{conj}(\text{acpr.p}_s) / \text{acpr.pref_SPL}^2)$	dB	Scattered sound pressure level	Domain 1
acpr.p_b	0	Pa	Background pressure field	Domain 1
acpr.rho	model.input.rho	kg/m ³	Density	Domain 1
acpr.c	model.input.c	m/s	Speed of sound	Domain 1
acpr.Q	0	1/s ²	Monopole source	Domain 1
acpr.qx	0	N/m ³	Dipole source, x component	Domain 1
acpr.qy	0	N/m ³	Dipole source, y component	Domain 1
acpr.qz	0	N/m ³	Dipole source, z component	Domain 1
acpr.q_totx	acpr.qx	N/m ³	Total dipole source, x component	Domain 1
acpr.q_toty	acpr.qy	N/m ³	Total dipole source, y component	Domain 1
acpr.q_totz	acpr.qz	N/m ³	Total dipole source, z component	Domain 1

Name	Expression	Unit	Description	Selection
acpr.nacc	0	m/s ²	Inward acceleration	Boundaries 1–8
acpr.FAcoPerAreax	acpr.p_t*acpr.nx	N/m ²	Acoustic load per unit area, x component	Boundaries 1–8
acpr.FAcoPerAreay	acpr.p_t*acpr.ny	N/m ²	Acoustic load per unit area, y component	Boundaries 1–8
acpr.FAcoPerAreaz	acpr.p_t*acpr.nz	N/m ²	Acoustic load per unit area, z component	Boundaries 1–8
acpr.p_t	p+acpr.p_b	Pa	Total acoustic pressure field	Domain 1
acpr.c_c	acpr.c	m/s	Complex speed of sound	Domain 1
acpr.rho_c	acpr.rho	kg/m ³	Complex density	Domain 1
acpr.Z	acpr.rho_c*acpr.c_c	Pa*s/m	Characteristic acoustic impedance	Domain 1
acpr.k	acpr.iomega/(i*acpr.c_c)	rad/m	Wave number	Domain 1
acpr.ik	acpr.iomega/acpr.c_c	rad/m	Phase-shifted wave number	Domain 1
acpr.gradpx	d(acpr.p_t,x)	N/m ³	Gradient of the total pressure, x component	Domain 1
acpr.gradpy	d(acpr.p_t,y)	N/m ³	Gradient of the total pressure, y component	Domain 1
acpr.gradpz	-acpr.ikz*acpr.p_t	N/m ³	Gradient of the total pressure, z component	Domain 1
acpr.gradtestpx	test(px)	N/m ³	Help variable for equations, x component	Domain 1
acpr.gradtestpy	test(py)	N/m ³	Help variable for equations, y component	Domain 1
acpr.gradtestpz	acpr.ikz*test(p)	N/m ³	Help variable for equations, z component	Domain 1

Name	Expression	Unit	Description	Selection
			component	
acpr.keq_sq	$-\text{acpr.ik}^2 + \text{acpr.ikz}^2$	1/m ²	Squared wave number for equations	Domain 1
acpr.keq	$\sqrt{\text{acpr.keq_sq}}$	rad/m	Wave number for equations	Domain 1
acpr.kip	$\sqrt{\text{acpr.keq_sq}}$	rad/m	In-plane wave number	Domain 1
acpr.ax	$-(\text{acpr.gradpx} - \text{acpr.q_totx})/\text{acpr.rho_c}$	m/s ²	Local acceleration, x component	Domain 1
acpr.ay	$-(\text{acpr.gradpy} - \text{acpr.q_toty})/\text{acpr.rho_c}$	m/s ²	Local acceleration, y component	Domain 1
acpr.az	$-(\text{acpr.gradpz} - \text{acpr.q_totz})/\text{acpr.rho_c}$	m/s ²	Local acceleration, z component	Domain 1
acpr.a_inst	$\sqrt{\text{real}(\text{acpr.ax})^2 + \text{real}(\text{acpr.ay})^2 + \text{real}(\text{acpr.az})^2}$	m/s ²	Instantaneous local acceleration	Domain 1
acpr.absp	$\sqrt{\text{realdot}(\text{acpr.p_t}, \text{acpr.p_t})}$	Pa	Absolute pressure	Domain 1
acpr.aipx	acpr.ax	m/s ²	In-plane acceleration, x component	Domain 1
acpr.aipy	acpr.ay	m/s ²	In-plane acceleration, y component	Domain 1
acpr.aipz	0	m/s ²	In-plane acceleration, z component	Domain 1
acpr.aopx	acpr.ax	m/s ²	Out-of-plane acceleration, x component	Domain 1
acpr.aopy	acpr.ay	m/s ²	Out-of-plane acceleration, y component	Domain 1
acpr.aopz	acpr.az	m/s ²	Out-of-plane acceleration, z component	Domain 1
acpr.aip_inst	$\sqrt{\text{real}(\text{acpr.aipx})^2 + \text{real}(\text{acpr.aipy})^2 + \text{real}(\text{acpr.aipz})^2}$	m/s ²	Instantaneous in-plane acceleration	Domain 1

Name	Expression	Unit	Description	Selection
acpr.aop_inst	$\sqrt{\text{real}(\text{acpr.aopx})^2 + \text{real}(\text{acpr.aopy})^2 + \text{real}(\text{acpr.aopz})^2}$	m/s ²	Instantaneous out-of-plane acceleration	Domain 1
acpr.a_rms	$\sqrt{0.5 * (\text{realdot}(\text{acpr.ax}, \text{acpr.ax}) + \text{realdot}(\text{acpr.ay}, \text{acpr.ay}) + \text{realdot}(\text{acpr.az}, \text{acpr.az}))}$	m/s ²	Local acceleration, (RMS)	Domain 1
acpr.vx	$-(\text{acpr.gradpx} - \text{acpr.q_totx}) / (\text{acpr.rho}_c * \text{acpr.iomega})$	m/s	Local velocity, x component	Domain 1
acpr.vy	$-(\text{acpr.gradpy} - \text{acpr.q_toty}) / (\text{acpr.rho}_c * \text{acpr.iomega})$	m/s	Local velocity, y component	Domain 1
acpr.vz	$-(\text{acpr.gradpz} - \text{acpr.q_totz}) / (\text{acpr.rho}_c * \text{acpr.iomega})$	m/s	Local velocity, z component	Domain 1
acpr.v_inst	$\sqrt{\text{real}(\text{acpr.vx})^2 + \text{real}(\text{acpr.vy})^2 + \text{real}(\text{acpr.vz})^2}$	m/s	Instantaneous local velocity	Domain 1
acpr.v_rms	$\sqrt{0.5 * (\text{realdot}(\text{acpr.vx}, \text{acpr.vx}) + \text{realdot}(\text{acpr.vy}, \text{acpr.vy}) + \text{realdot}(\text{acpr.vz}, \text{acpr.vz}))}$	m/s	Local velocity, (RMS)	Domain 1
acpr.lx	$0.5 * \text{realdot}(\text{acpr.p}_t, \text{acpr.v}_x)$	W/m ²	Intensity (RMS), x component	Domain 1
acpr.ly	$0.5 * \text{realdot}(\text{acpr.p}_t, \text{acpr.v}_y)$	W/m ²	Intensity (RMS), y component	Domain 1
acpr.lz	$0.5 * \text{realdot}(\text{acpr.p}_t, \text{acpr.v}_z)$	W/m ²	Intensity (RMS), z component	Domain 1
acpr.l_rms	$\sqrt{\text{acpr.lx}^2 + \text{acpr.ly}^2 + \text{acpr.lz}^2}$	W/m ²	Intensity magnitude (RMS)	Domain 1
acpr.lix	$\text{real}(\text{acpr.vx}) * \text{real}(\text{acpr.p}_t)$	W/m ²	Instantaneous intensity, x component	Domain 1
acpr.liy	$\text{real}(\text{acpr.vy}) * \text{real}(\text{acpr.p}_t)$	W/m ²	Instantaneous intensity, y component	Domain 1
acpr.liz	$\text{real}(\text{acpr.vz}) * \text{real}(\text{acpr.p}_t)$	W/m ²	Instantaneous intensity, z component	Domain 1
acpr.l_inst	$\sqrt{\text{acpr.lix}^2 + \text{acpr.liy}^2 + \text{acpr.liz}^2}$	W/m ²	Instantaneous	Domain 1

Name	Expression	Unit	Description	Selection
	acpr.liz^2)		intensity magnitude	
acpr.Lp	$10 \cdot \log_{10}(0.5 \cdot \text{acpr.p_t} \cdot \text{conj}(\text{acpr.p_t}) / \text{acpr.pref_SPL}^2)$	dB	Sound pressure level	Domain 1
acpr.vipx	acpr.vx	m/s	In-plane velocity, x component	Domain 1
acpr.vipy	acpr.vy	m/s	In-plane velocity, y component	Domain 1
acpr.vipz	0	m/s	In-plane velocity, z component	Domain 1
acpr.vopx	acpr.vx	m/s	Out-of-plane velocity, x component	Domain 1
acpr.vopy	acpr.vy	m/s	Out-of-plane velocity, y component	Domain 1
acpr.vopz	acpr.vz	m/s	Out-of-plane velocity, z component	Domain 1
acpr.aip_rms	$\sqrt{0.5 \cdot (\text{realdot}(\text{acpr.aipx}, \text{acpr.aipx}) + \text{realdot}(\text{acpr.aipy}, \text{acpr.aipy}) + \text{realdot}(\text{acpr.aipz}, \text{acpr.aipz}))}$	m/s ²	In-plane acceleration, (RMS)	Domain 1
acpr.aop_rms	$\sqrt{0.5 \cdot (\text{realdot}(\text{acpr.aopx}, \text{acpr.aopx}) + \text{realdot}(\text{acpr.aopy}, \text{acpr.aopy}) + \text{realdot}(\text{acpr.aopz}, \text{acpr.aopz}))}$	m/s ²	Out-of-plane acceleration, (RMS)	Domain 1
acpr.vop_rms	$\sqrt{0.5 \cdot (\text{realdot}(\text{acpr.vopx}, \text{acpr.vopx}) + \text{realdot}(\text{acpr.vopy}, \text{acpr.vopy}) + \text{realdot}(\text{acpr.vopz}, \text{acpr.vopz}))}$	m/s	Out-of-plane velocity, (RMS)	Domain 1
acpr.vip_inst	$\sqrt{\text{real}(\text{acpr.vopx})^2 + \text{real}(\text{acpr.vopy})^2 + \text{real}(\text{acpr.vopz})^2}$	m/s	Instantaneous in-plane velocity	Domain 1
acpr.vip_rms	$\sqrt{0.5 \cdot (\text{realdot}(\text{acpr.vipx}, \text{acpr.vipx}) + \text{realdot}(\text{acpr.vipy}, \text{acpr.vipy}) + \text{realdot}(\text{acpr.vipz}, \text{acpr.vipz}))}$	m/s	In-plane velocity, (RMS)	Domain 1
acpr.diss_visc	0	W/m ³	Viscous power	Domain 1

Name	Expression	Unit	Description	Selection
			dissipation density	
acpr.diss_therm	0	W/m ³	Thermal power dissipation density	Domain 1
acpr.diss_tot	acpr.diss_visc+acpr.diss_therm	W/m ³	Total thermo-viscous power dissipation density	Domain 1
acpr.pam1.mininput_temperature	model.input.mininput_temperature	K	Temperature	Domain 1
acpr.pam1.mininput_pressure	1[atm]	Pa	Absolute pressure	Domain 1

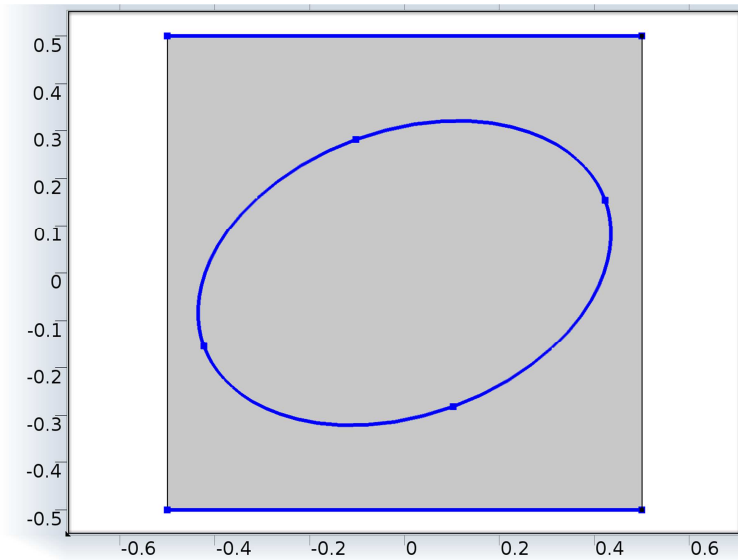
Shape functions

Name	Shape function	Unit	Description	Shape frame	Selection
p	Lagrange (Quadratic)	Pa	Pressure	Material	Domain 1

Weak expressions

Weak expression	Integration frame	Selection
$(-acpr.gradpx*acpr.gradtestpx-acpr.gradpy*acpr.gradtestpy-acpr.gradpz*acpr.gradtestpz-acpr.p_t*test(p)*acpr.ik^2)*acpr.delta/acpr.rho_c$	Material	Domain 1
acpr.delta*acpr.Q*test(p)	Material	Domain 1
$acpr.delta*(acpr.q_totx*acpr.gradtestpx+acpr.q_toty*acpr.gradtestpy+acpr.q_totz*acpr.gradtestpz)/acpr.rho_c$	Material	Domain 1

2.4.2 Sound Hard Boundary (Wall) 1



Sound Hard Boundary (Wall) 1

Selection

Geometric entity level	Boundary
Selection	Boundaries 2–3, 5–8

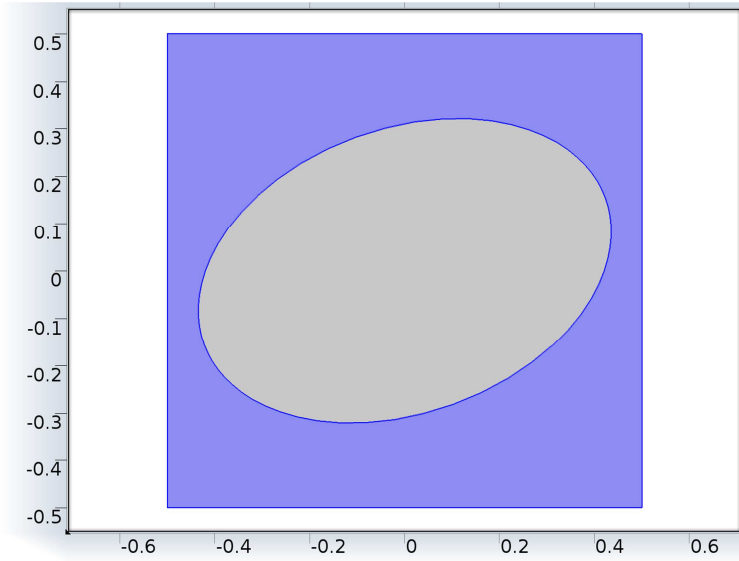
Equations

$$-\mathbf{n} \cdot \left(-\frac{1}{\rho_c} (\nabla \rho_t - \mathbf{q}_d) \right) = 0$$

Used products

COMSOL Multiphysics

2.4.3 Initial Values 1



Initial Values 1

Selection

Geometric entity level	Domain
Selection	Domain 1

Settings

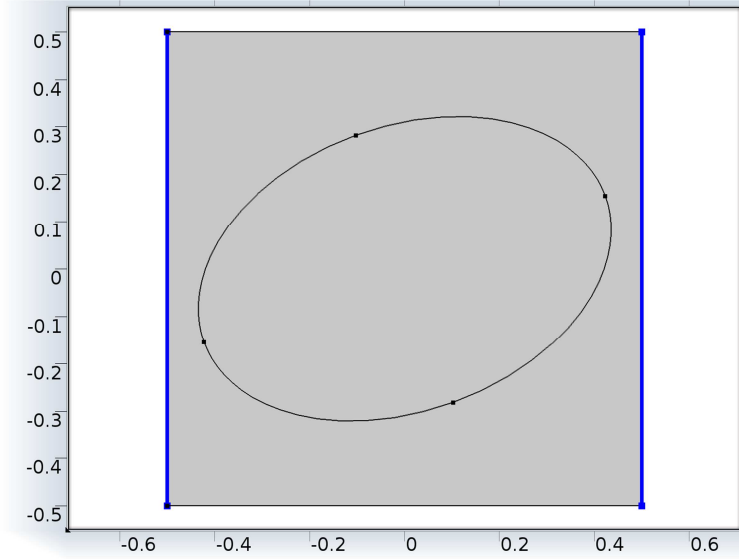
Settings

Description	Value
Pressure	0
Pressure, first time derivative	0

Used products

COMSOL Multiphysics

2.4.4 Periodic Condition 1



Periodic Condition 1

Selection

Geometric entity level	Boundary
Selection	Boundaries 1, 4

Equations

$$p_{dst} = p_{src} e^{-i\mathbf{k}_F \cdot (\mathbf{r}_{dst} - \mathbf{r}_{src})}$$

$$-\mathbf{n}_{dst} \cdot \left(-\frac{1}{\rho_c} (\nabla p_t - \mathbf{q}_d) \right)_{dst} = \mathbf{n}_{src} \cdot \left(-\frac{1}{\rho_c} (\nabla p_t - \mathbf{q}_d) \right)_{src} e^{i\mathbf{k}_F \cdot (\mathbf{r}_{dst} - \mathbf{r}_{src})}$$

Settings

Settings

Description	Value
Type of periodicity	Floquet periodicity
k-vector for Floquet periodicity, x component	kx
k-vector for Floquet periodicity, y component	0
k-vector for Floquet periodicity, z component	0
Apply reaction terms on	All physics (symmetric)
Use weak constraints	0

Variables

Name	Expression	Unit	Description	Selection
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Name	Expression	Unit	Description	Selection
acpr.rsrcx_pc1	acpr.src_avg_pc1(x)	m	Source origin, x component	Global
acpr.rsrcy_pc1	acpr.src_avg_pc1(y)	m	Source origin, y component	Global
acpr.rsrcz_pc1	acpr.src_avg_pc1(0)	m	Source origin, z component	Global
acpr.rdstx_pc1	acpr.dst_avg_pc1(x)	m	Destination origin, x component	Global
acpr.rdsty_pc1	acpr.dst_avg_pc1(y)	m	Destination origin, y component	Global
acpr.rdstz_pc1	acpr.dst_avg_pc1(0)	m	Destination origin, z component	Global
acpr.kFloquetx	kx	rad/m	k-vector for Floquet periodicity, x component	Boundary 1
acpr.kFloquety	0	rad/m	k-vector for Floquet periodicity, y component	Boundary 1
acpr.kFloquetz	0	rad/m	k-vector for Floquet periodicity, z component	Boundary 1
acpr.kFloquetx	kx	rad/m	k-vector for Floquet periodicity, x component	Boundary 4
acpr.kFloquety	0	rad/m	k-vector for Floquet periodicity, y component	Boundary 4
acpr.kFloquetz	0	rad/m	k-vector for Floquet periodicity, z component	Boundary 4

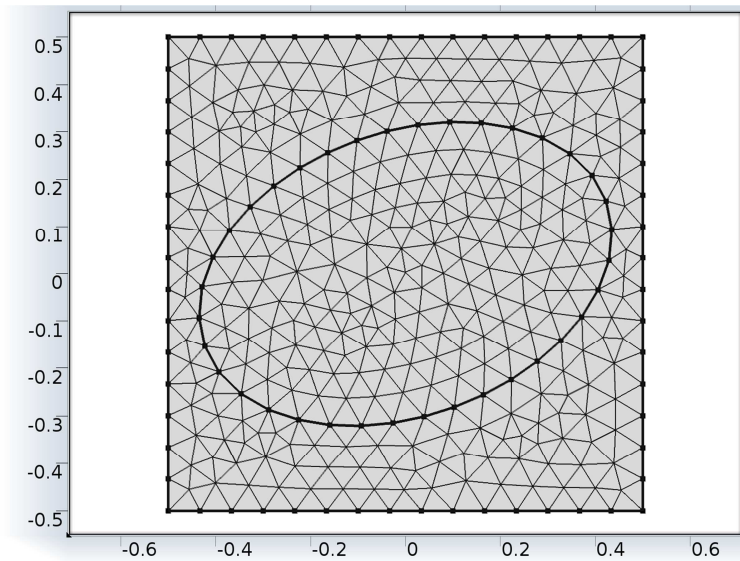
Constraints

Constraint	Constraint force	Shape function	Selection
if(acpr.src2dst_pc1,p-acpr.src2dst_pc1(p)*exp(j*(-acpr.kFloquetx*(acpr.rdstx_pc1-acpr.rsrcx_pc1)-acpr.kFloquety*(acpr.rdsty_pc1-acpr.rsrcy_pc1)-acpr.kFloquetz*(acpr.rdstz_pc1-acpr.rsrcz_pc1))),0)	if(acpr.src2dst_pc1,test(p)*exp(j*(-acpr.kFloquetx*(acpr.rdstx_pc1-acpr.rsrcx_pc1)-acpr.kFloquety*(acpr.rdsty_pc1-acpr.rsrcy_pc1)-acpr.kFloquetz*(acpr.rdstz_pc1-acpr.rsrcz_pc1)))-test(acpr.src2dst_pc1(p)),0)	Lagrange (Quadratic)	Boundary 4

2.5 Mesh 1

Mesh statistics

Property	Value
Minimum element quality	0.791
Average element quality	0.9538
Triangular elements	686
Edge elements	96
Vertex elements	8



Mesh 1

2.5.1 Size (size)

Settings

Name	Value
Maximum element size	0.067
Minimum element size	3.0E-4
Resolution of curvature	0.3
Maximum element growth rate	1.3

2.5.2 Free Triangular 1 (ftri1)

Selection

Geometric entity level	Remaining
------------------------	-----------

3 Study 1

3.1 Parametric Sweep

Parameter name: kx

Parameters:

3.2 Eigenfrequency

Study settings

Property	Value
Include geometric nonlinearity	Off

Mesh selection

Geometry	Mesh
Geometry 1 (geom1)	mesh1

Physics selection

Physics	Discretization
Pressure Acoustics, Frequency Domain (acpr)	physics

3.3 Solver Configurations

3.3.1 Solver 1

Compile Equations: Eigenfrequency (st1)

Study and step

Name	Value
Use study	Study 1
Use study step	Eigenfrequency

Dependent Variables 1 (v1)

General

Name	Value
Defined by study step	Eigenfrequency

Initial values of variables solved for

Name	Value
Solution	Zero

Values of variables not solved for

Name	Value
Solution	Zero

mod1.p (mod1_p)

General

Name	Value
Field components	mod1.p

Eigenvalue Solver 1 (e1)

General

Name	Value
Defined by study step	Eigenfrequency
Eigenvalue transformation	Eigenfrequency
Value	100

Values of linearization point

Name	Value
Solution	Zero
Point	100

Log

```

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:44.
Eigenvalue solver
Number of degrees of freedom solved for: 868.
Symmetric matrices found.
Scales for dependent variables:
mod1.p: 1
Iter      ErrEst  Nconv
  1        0.0045    5
  2        4.5e-006   10
  3        3.4e-007   12
40 linear system solutions.
40 matrix multiplications.
39 re-orthogonalizations.
Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

```

Advanced (aDef)

General

Name	Value
Allow complex-valued output from functions with real input	On

3.3.2 Parametric 2

Store Solution 3 (su1)

General

Name	Value
Solution	Store Solution 3

Log

```
Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:11.
Eigenvalue solver
Number of degrees of freedom solved for: 868.
Symmetric matrices found.
Scales for dependent variables:
modl.p: 1
Iter      ErrEst  Nconv
   1      0.0039    5
   2      1e-005   10
   3      6.9e-007   12
40 linear system solutions.
40 matrix multiplications.
39 re-orthogonalizations.
Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.
```

Store Solution 4 (su2)

General

Name	Value
Solution	Store Solution 4

Log

```
Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:13.
Eigenvalue solver
Number of degrees of freedom solved for: 868.
Nonsymmetric matrix found.
Scales for dependent variables:
modl.p: 1
Iter      ErrEst  Nconv
   1      0.012    5
   2      0.00056  10
   3      1.4e-006  11
   4      2.8e-009  12
47 linear system solutions.
47 matrix multiplications.
46 re-orthogonalizations.
Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.
```

Store Solution 5 (su3)

General

Name	Value
------	-------

Name	Value
Solution	Store Solution 5

Log

```

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:14.
Eigenvalue solver
Number of degrees of freedom solved for: 868.
Nonsymmetric matrix found.
Scales for dependent variables:
mod1.p: 1
Iter      ErrEst  Nconv
  1       0.0043    6
  2       0.00017   9
  3       2.9e-007  12
39 linear system solutions.
39 matrix multiplications.
38 re-orthogonalizations.
Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

```

Store Solution 6 (su4)

General

Name	Value
Solution	Store Solution 6

Log

```

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:16.
Eigenvalue solver
Number of degrees of freedom solved for: 868.
Nonsymmetric matrix found.
Scales for dependent variables:
mod1.p: 1
Iter      ErrEst  Nconv
  1       0.0018    6
  2       4.1e-005  10
  3       4.3e-008  12
39 linear system solutions.
39 matrix multiplications.
38 re-orthogonalizations.
Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

```

Store Solution 7 (su5)

General

Name	Value
Solution	Store Solution 7

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:18.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.0031	6
2	2.4e-005	10
3	1.7e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 8 (su6)

General

Name	Value
Solution	Store Solution 8

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:19.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.0027	6
2	1.9e-005	10
3	1.8e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 9 (su7)

General

Name	Value
Solution	Store Solution 9

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:21.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.0023	6
2	1.2e-005	10
3	8.9e-008	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 10 (su8)

General

Name	Value
Solution	Store Solution 10

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:23.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.014	7
2	6.6e-005	10
3	5.8e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 11 (su9)

General

Name	Value
Solution	Store Solution 11

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:24.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.0066	6
2	4.5e-005	11
3	3.4e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 12 (su10)

General

Name	Value
Solution	Store Solution 12

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:26.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.0065	7
2	7.1e-005	11
3	4.7e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 1 s.

Store Solution 13 (su11)

General

Name	Value
Solution	Store Solution 13

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:28.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.0044	7
2	2.5e-005	11
3	3e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 14 (su12)

General

Name	Value
Solution	Store Solution 14

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:29.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.011	7
2	5.1e-005	11
3	4.1e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 15 (su13)

General

Name	Value
Solution	Store Solution 15

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:31.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.0042	7
2	9.1e-005	10
3	2.2e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 16 (su14)

General

Name	Value
Solution	Store Solution 16

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:33.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.014	7
2	0.00031	10
3	6.7e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 17 (su15)

General

Name	Value
Solution	Store Solution 17

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:35.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.015	7
2	0.00019	10
3	5e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 18 (su16)

General

Name	Value
Solution	Store Solution 18

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:36.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.013	7
2	0.00025	10
3	5.2e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 19 (su17)

General

Name	Value
Solution	Store Solution 19

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:38.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.047	7
2	0.0013	9
3	2.4e-006	11
4	4.8e-009	12

 46 linear system solutions.
 46 matrix multiplications.
 45 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 20 (su18)

General

Name	Value
Solution	Store Solution 20

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:40.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.042	7
2	0.0018	9
3	3.9e-006	11
4	8.8e-009	12

 46 linear system solutions.
 46 matrix multiplications.
 45 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 21 (su19)

General

Name	Value
Solution	Store Solution 21

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:42.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.043	7
2	0.0012	9
3	2.4e-006	11
4	4.3e-009	12

 46 linear system solutions.
 46 matrix multiplications.
 44 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 22 (su20)

General

Name	Value
Solution	Store Solution 22

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:44.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.034	7
2	0.0023	9
3	3.8e-006	11
4	7.5e-009	12

 46 linear system solutions.
 46 matrix multiplications.
 45 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 23 (su21)

General

Name	Value
Solution	Store Solution 23

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:45.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.059	7
2	0.0042	9
3	1e-005	11
4	2e-008	12

 46 linear system solutions.
 46 matrix multiplications.
 45 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 24 (su22)

General

Name	Value
Solution	Store Solution 24

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:47.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.037	7
2	0.0014	9
3	1.5e-006	11
4	2.9e-009	12

 46 linear system solutions.
 46 matrix multiplications.
 45 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 25 (su23)

General

Name	Value
Solution	Store Solution 25

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:49.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.042	7
2	0.0078	9
3	9.2e-006	10
4	1.9e-008	12

 46 linear system solutions.
 46 matrix multiplications.
 45 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 26 (su24)

General

Name	Value
Solution	Store Solution 26

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:51.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.043	7
2	0.012	9
3	1.3e-005	10
4	1.6e-008	12

 46 linear system solutions.
 46 matrix multiplications.
 45 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 27 (su25)

General

Name	Value
Solution	Store Solution 27

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:53.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.019	7
2	0.017	9
3	0.0001	10
4	1.6e-007	12

 46 linear system solutions.
 46 matrix multiplications.
 45 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 28 (su26)

General

Name	Value
Solution	Store Solution 28

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:55.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.021	7
2	0.014	9
3	5.3e-005	10
4	6.9e-008	12

 46 linear system solutions.
 46 matrix multiplications.
 45 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 29 (su27)

General

Name	Value
Solution	Store Solution 29

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:57.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.045	6
2	0.0074	9
3	7.7e-006	10
4	1.4e-008	12

 46 linear system solutions.
 46 matrix multiplications.
 45 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 30 (su28)

General

Name	Value
Solution	Store Solution 30

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:55:59.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.056	7
2	0.007	9
3	1.5e-005	10
4	1.7e-008	12

 46 linear system solutions.
 46 matrix multiplications.
 45 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 31 (su29)

General

Name	Value
Solution	Store Solution 31

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:01.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.035	7
2	0.0022	9
3	2.7e-006	11
4	4.8e-009	12

 46 linear system solutions.
 46 matrix multiplications.
 45 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 32 (su30)

General

Name	Value
Solution	Store Solution 32

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:03.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.037	7
2	0.0023	9
3	3.4e-006	11
4	5.8e-009	12

 46 linear system solutions.
 46 matrix multiplications.
 45 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 33 (su31)

General

Name	Value
Solution	Store Solution 33

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:04.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.042	7
2	0.0015	9
3	2.5e-006	11
4	3.9e-009	12

 46 linear system solutions.
 46 matrix multiplications.
 45 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 1 s.

Store Solution 34 (su32)

General

Name	Value
Solution	Store Solution 34

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:07.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.035	7
2	0.00088	9
3	1.6e-006	11
4	3.3e-009	12

 46 linear system solutions.
 46 matrix multiplications.
 45 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 35 (su33)

General

Name	Value
Solution	Store Solution 35

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:08.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.0078	7
2	0.00022	9
3	6.6e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 36 (su34)

General

Name	Value
Solution	Store Solution 36

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:10.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.012	7
2	0.00034	10
3	9e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 37 (su35)

General

Name	Value
Solution	Store Solution 37

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:12.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.013	7
2	0.0004	10
3	1.1e-006	11
4	2.6e-009	12

 46 linear system solutions.
 46 matrix multiplications.
 45 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 38 (su36)

General

Name	Value
Solution	Store Solution 38

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:14.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.0044	7
2	9.7e-005	10
3	4.8e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 37 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 39 (su37)

General

Name	Value
Solution	Store Solution 39

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:17.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.029	7
2	0.00092	10
3	2.2e-006	11
4	5.5e-009	12

 46 linear system solutions.
 46 matrix multiplications.
 45 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 40 (su38)

General

Name	Value
Solution	Store Solution 40

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:19.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.0046	7
2	7.1e-005	10
3	3.3e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 37 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 41 (su39)

General

Name	Value
Solution	Store Solution 41

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:21.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.0028	7
2	1.9e-005	11
3	1.7e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 37 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 42 (su40)

General

Name	Value
Solution	Store Solution 42

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:23.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.015	7
2	7.7e-005	11
3	9.2e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 37 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 43 (su41)

General

Name	Value
Solution	Store Solution 43

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:25.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.0052	6
2	5.7e-005	10
3	2.8e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 44 (su42)

General

Name	Value
Solution	Store Solution 44

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:27.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.0031	6
2	1.4e-005	10
3	1.4e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 45 (su43)

General

Name	Value
Solution	Store Solution 45

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:29.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.0025	7
2	1.7e-005	10
3	1.4e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 46 (su44)

General

Name	Value
Solution	Store Solution 46

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:31.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.0024	6
2	1.7e-005	10
3	1.9e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 47 (su45)

General

Name	Value
Solution	Store Solution 47

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:33.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 modl.p: 1

Iter	ErrEst	Nconv
1	0.0028	6
2	1.9e-005	10
3	1.5e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 48 (su46)

General

Name	Value
Solution	Store Solution 48

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:35.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 modl.p: 1

Iter	ErrEst	Nconv
1	0.0056	6
2	7.5e-005	10
3	9.9e-008	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 49 (su47)

General

Name	Value
Solution	Store Solution 49

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:37.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 modl.p: 1

Iter	ErrEst	Nconv
1	0.0084	6
2	0.00017	10
3	1.7e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 50 (su48)

General

Name	Value
Solution	Store Solution 50

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:39.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 modl.p: 1

Iter	ErrEst	Nconv
1	0.0053	6
2	0.00015	10
3	3.7e-007	12

 39 linear system solutions.
 39 matrix multiplications.
 38 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 51 (su49)

General

Name	Value
Solution	Store Solution 51

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:42.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Nonsymmetric matrix found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.0031	5
2	0.00023	10
3	8.5e-007	12

 40 linear system solutions.
 40 matrix multiplications.
 39 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

Store Solution 52 (su50)

General

Name	Value
Solution	Store Solution 52

Log

Eigenvalue Solver 1 in Solver 1 started at 4-jul-2013 13:56:44.
 Eigenvalue solver
 Number of degrees of freedom solved for: 868.
 Symmetric matrices found.
 Scales for dependent variables:
 mod1.p: 1

Iter	ErrEst	Nconv
1	0.0045	5
2	4.5e-006	10
3	3.4e-007	12

 40 linear system solutions.
 40 matrix multiplications.
 39 re-orthogonalizations.
 Eigenvalue Solver 1 in Solver 1: Solution time: 0 s.

4 Results

4.1 Data Sets

4.1.1 Solution 1

Selection

Geometric entity level	Domain
Selection	Geometry geom1

Solution

Name	Value
Solution	Solver 1
Model	Save Point Geometry 1

4.1.2 Solution 2

Selection

Geometric entity level	Domain
Selection	Geometry geom1

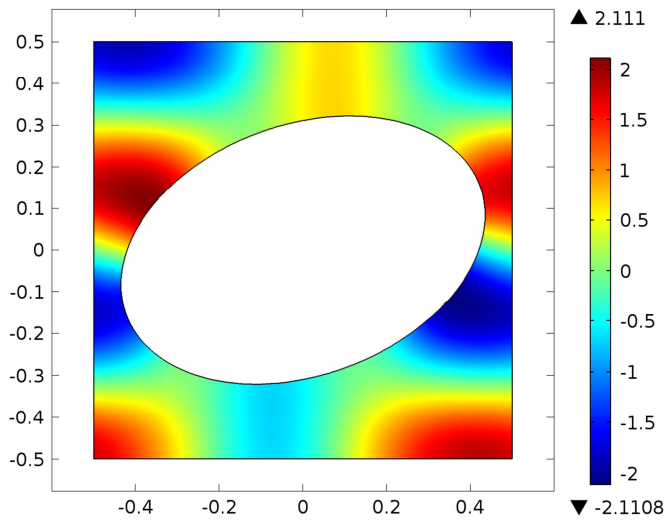
Solution

Name	Value
Solution	Parametric 2
Model	Save Point Geometry 1

4.2 Plot Groups

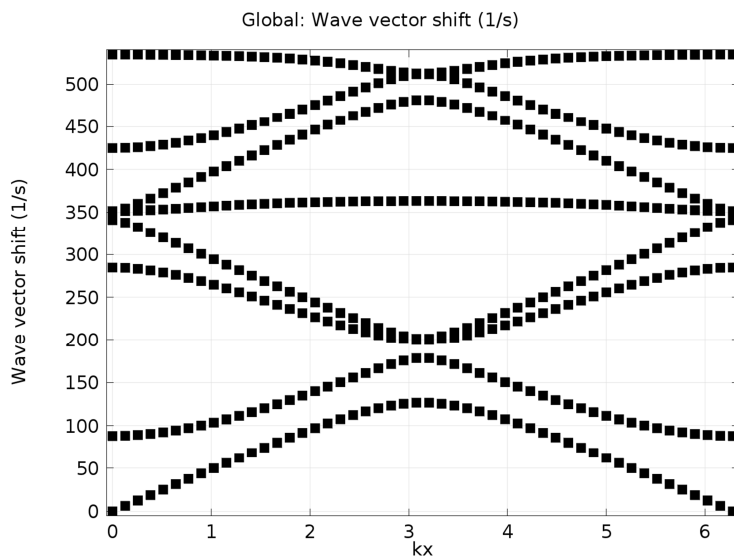
4.2.1 Acoustic Pressure (acpr)

Eigenfrequency=534.174286 Surface: Total acoustic pressure field (Pa)



Eigenfrequency=534.174286 Surface: Total acoustic pressure field (Pa)

4.2.2 1D Plot Group 2



Global: Wave vector shift (1/s)