Murata Software

Q: How to set a symmetric model?

A: If a target model has a half, quarter, or 1/8 symmetry in the deformation or electric field direction, create a half, quarter, or /18 model and set reflective boundary conditions to the cutting portions, resulting in fewer meshes and less computation load.

By clicking [Full Model] on the [Results] tab, you can view the results of the whole model. However, the result table displays values, such as admittance, that are calculated over the symmetric model.
For instance, if the model is a quarter mode, the calculated admittance is one-fourth admittance of the whole model.
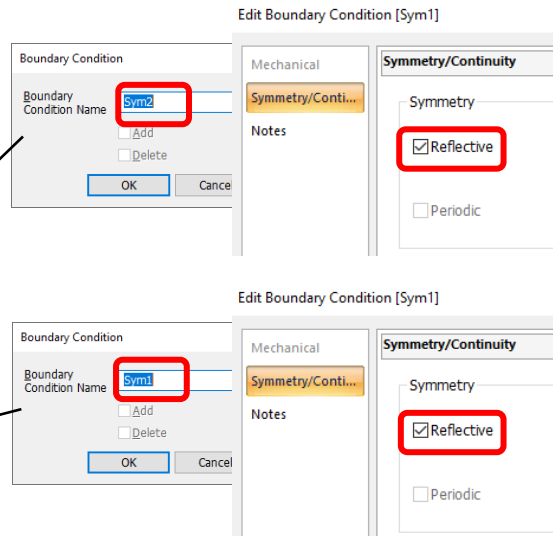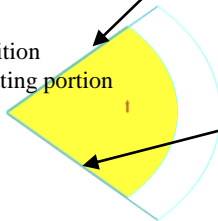
Please refer to the next slides.

Additional Information

Symmetric model

- If a target model has a half, quarter, or 1/8 symmetry in the deformation or electric field direction, create a half, quarter, or /18 model and set reflective boundary conditions to the cutting portions, resulting in fewer meshes and less computation load.
- On the right diagram, the reflective boundary conditions are set as follows:

Sym1 is applied to the cross-sectional portion in the Y direction.

Sym2 is applied to the cross-sectional portion in the X direction.

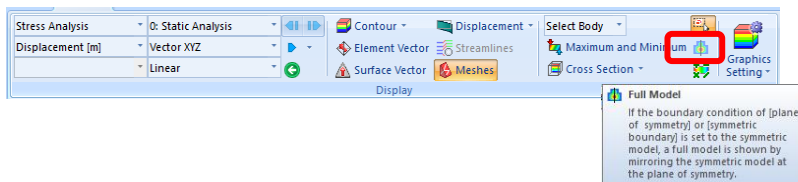Boundary condition specified on cutting portion

Edit Boundary Condition [Sym1]

Boundary Condition	Mechanical	**Symmetry/Continuity**
Boundary Condition Name: Sym2	Symmetry/Conti...	Symmetry
Add	Notes	☑ Reflective
Delete		
OK Cancel		☐ Periodic

Edit Boundary Condition [Sym1]

Boundary Condition	Mechanical	**Symmetry/Continuity**
Boundary Condition Name: Sym1	Symmetry/Conti...	Symmetry
Add	Notes	☑ Reflective
Delete		
OK Cancel		☐ Periodic

Please refer to the example on the help menu below for more information.

Home>Examples>Piezoelectric Analysis [Rayleigh]>Example 2: Harmonic Analysis

Additional Information
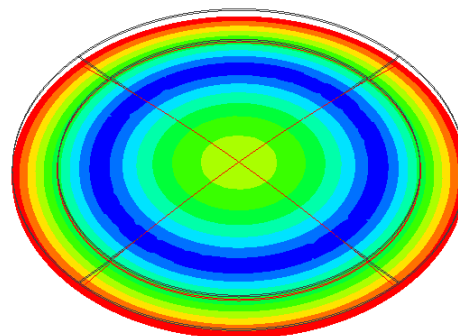
Result Display of Symmetric Model

- By clicking [Full Model] on the [Results] tab, you can view the results of the whole model.

- The result table displays values, such as admittance, that are calculated over the symmetric model. For instance, if the model is a quarter mode, the calculated admittance is one-fourth admittance of the whole model.

Full Model
If the boundary condition of [plane of symmetry] or [symmetry boundary] is set to the symmetric model, a full model is shown by mirroring the symmetric model at the plane of symmetry.
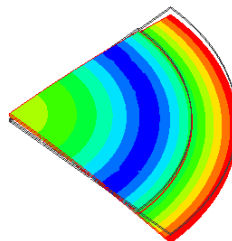
[Symmetric Model]   [Full Model]

Table

Admittance	Impedance	Charge [C]	Current [A]	FEM Info

	Real Part	Imaginary Part
Port 1	hot	
Y(1,1)	2.626e-8	5.583e-6