

# Question 18

**Q:** Can Femtet analyze the vibration caused by piezoelectricity and the generated sound waves in a coupled analysis?

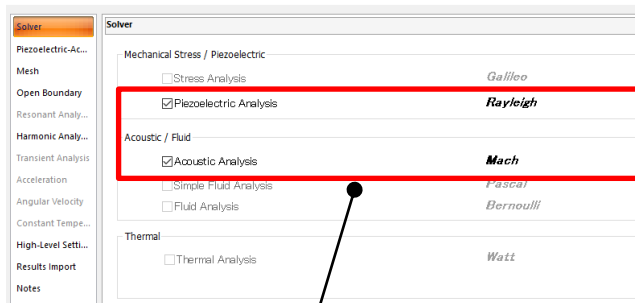
**A:** Yes, Femtet can do it.

The piezoelectric analysis can be coupled with the acoustic analysis by using the piezoelectricity-vibrated object as a vibration source. Whether fully coupled or not is selectable.

Please refer to the procedures shown below.

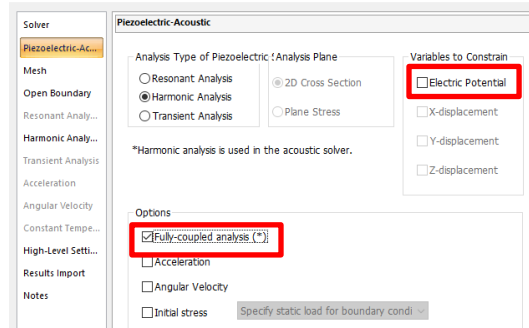
## Analysis Condition Setting

Analysis Condition Setting



Select the piezoelectric and acoustic analyses.

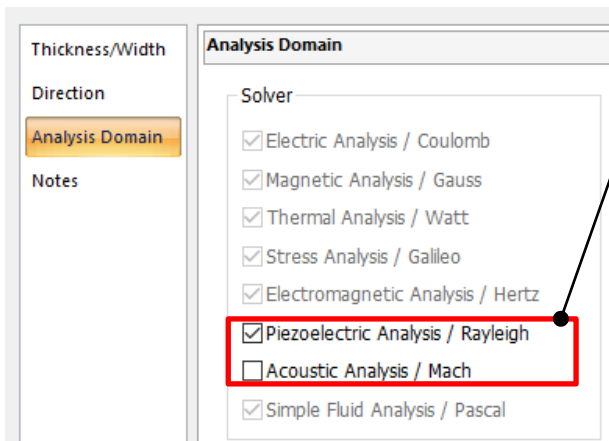
Analysis Condition Setting



Select [Fully-Coupled Analysis].  
If piezoelectricity is not taken into account,  
select [Electric Potential] to constrain it.

## Body Attribute

Edit Body Attribute [Plate]



Analysis Domain	
Solver	
<input checked="" type="checkbox"/>	Electric Analysis / Coulomb
<input checked="" type="checkbox"/>	Magnetic Analysis / Gauss
<input checked="" type="checkbox"/>	Thermal Analysis / Watt
<input checked="" type="checkbox"/>	Stress Analysis / Galileo
<input checked="" type="checkbox"/>	Electromagnetic Analysis / Hertz
<input checked="" type="checkbox"/>	Piezoelectric Analysis / Rayleigh
<input type="checkbox"/>	Acoustic Analysis / Mach
<input checked="" type="checkbox"/>	Simple Fluid Analysis / Pascal

For a solid body, select [Piezoelectric Analysis/Rayleigh].  
For a medium, select [Acoustic Analysis/Mach].  
**Not both can be selected.**

## Piezoelectric-acoustic not-fully-coupled analysis (Piezoelectric → Acoustic: one-way coupled analysis)

It can not be calculated that the generated sound waves will vibrate the structure.

The sound waves outside the sound-insulating plate can not be calculated.

## Piezoelectric-acoustic fully-coupled analysis (Piezoelectric ↔ Acoustic: two-way coupled analysis)

It can be calculated that the generated sound waves will vibrate the structure.

The sound waves outside the sound-insulating plate can be calculated, but this will require a longer calculation time.

