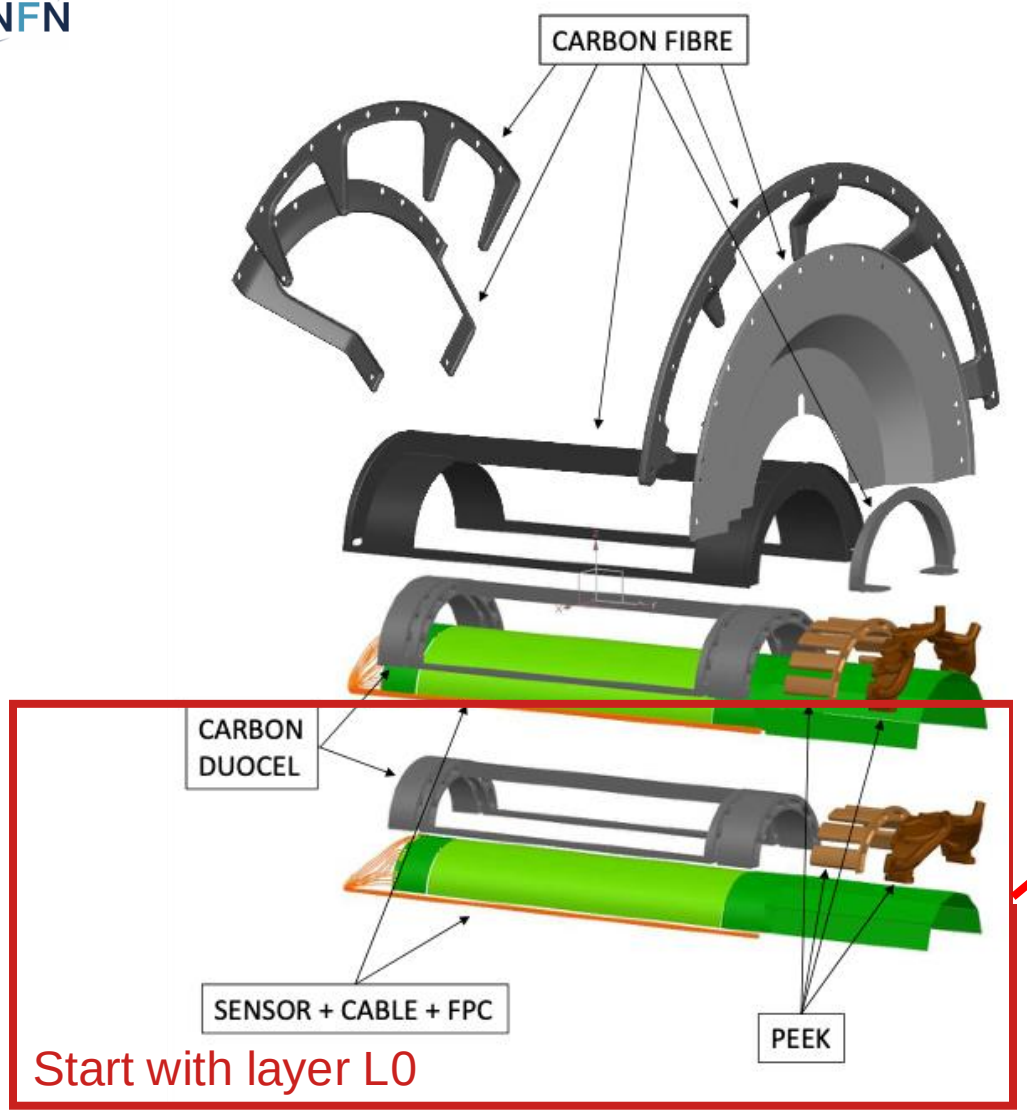
Vibrational/Thermal analysis of L0-L1

Material properties derived from ALICE-TDR-021

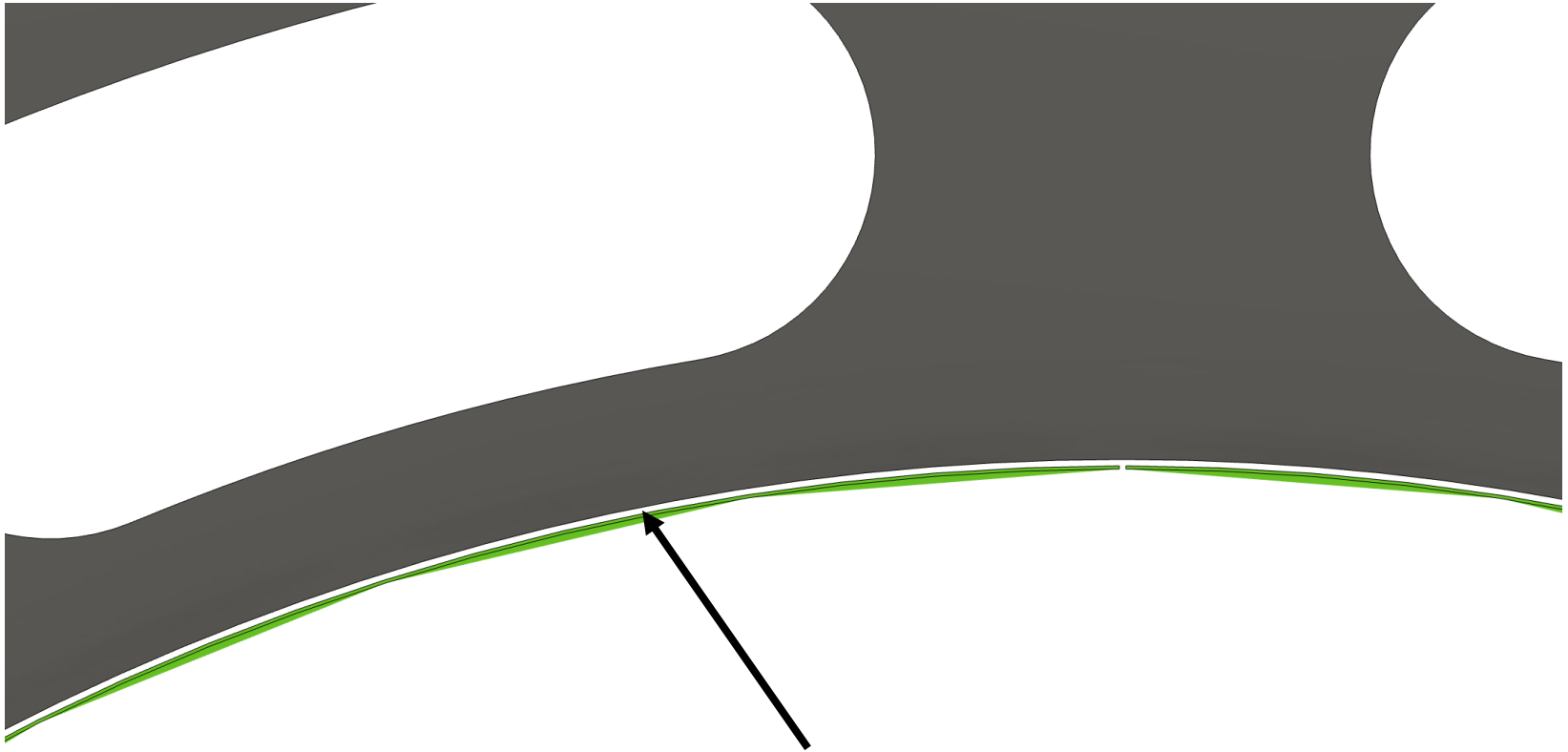
Uniform isotropic silicon foil of 50 um

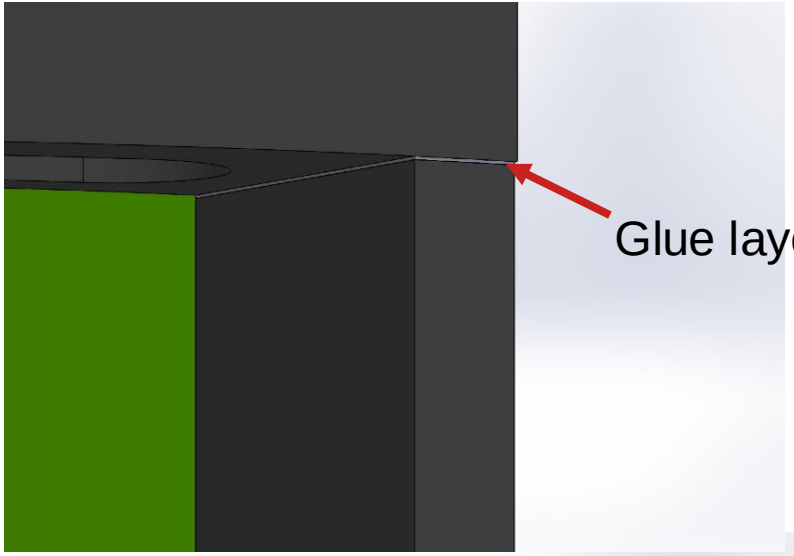
Bonded contact is considered and the glue in between

INFN- TIFPA


CARBON FIBRE
CARBON
DUOCEL
SENSOR + CABLE + FPC
PEEK
Start with layer L0

L0 model


Intermediate glue layer

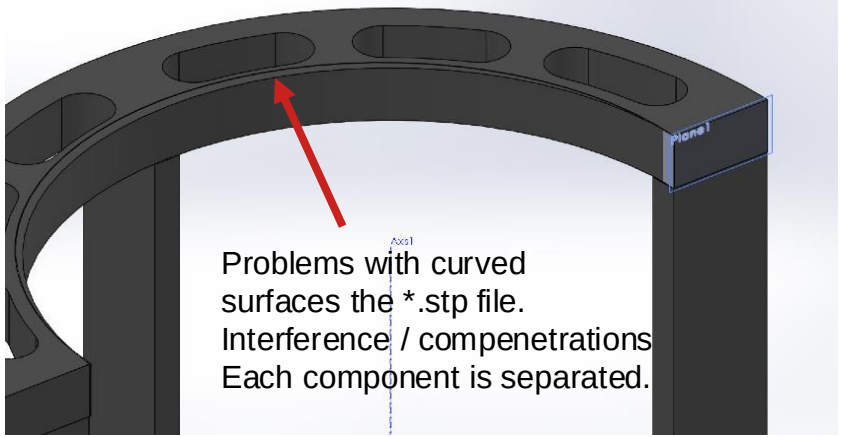


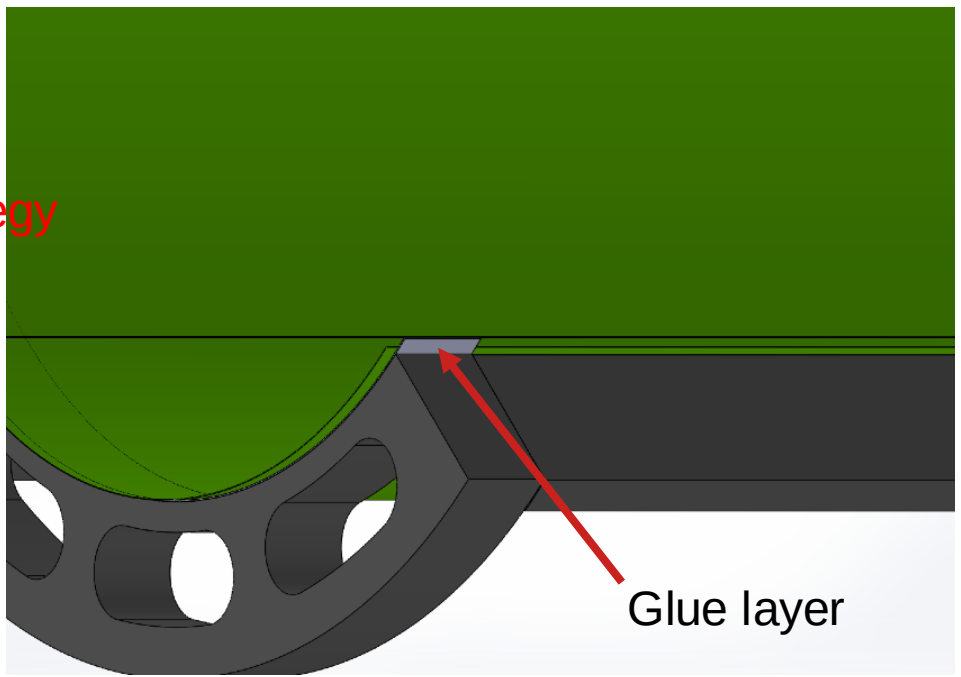
The overall mesh shoud be connected.
Use of solid elements also for thin layers.

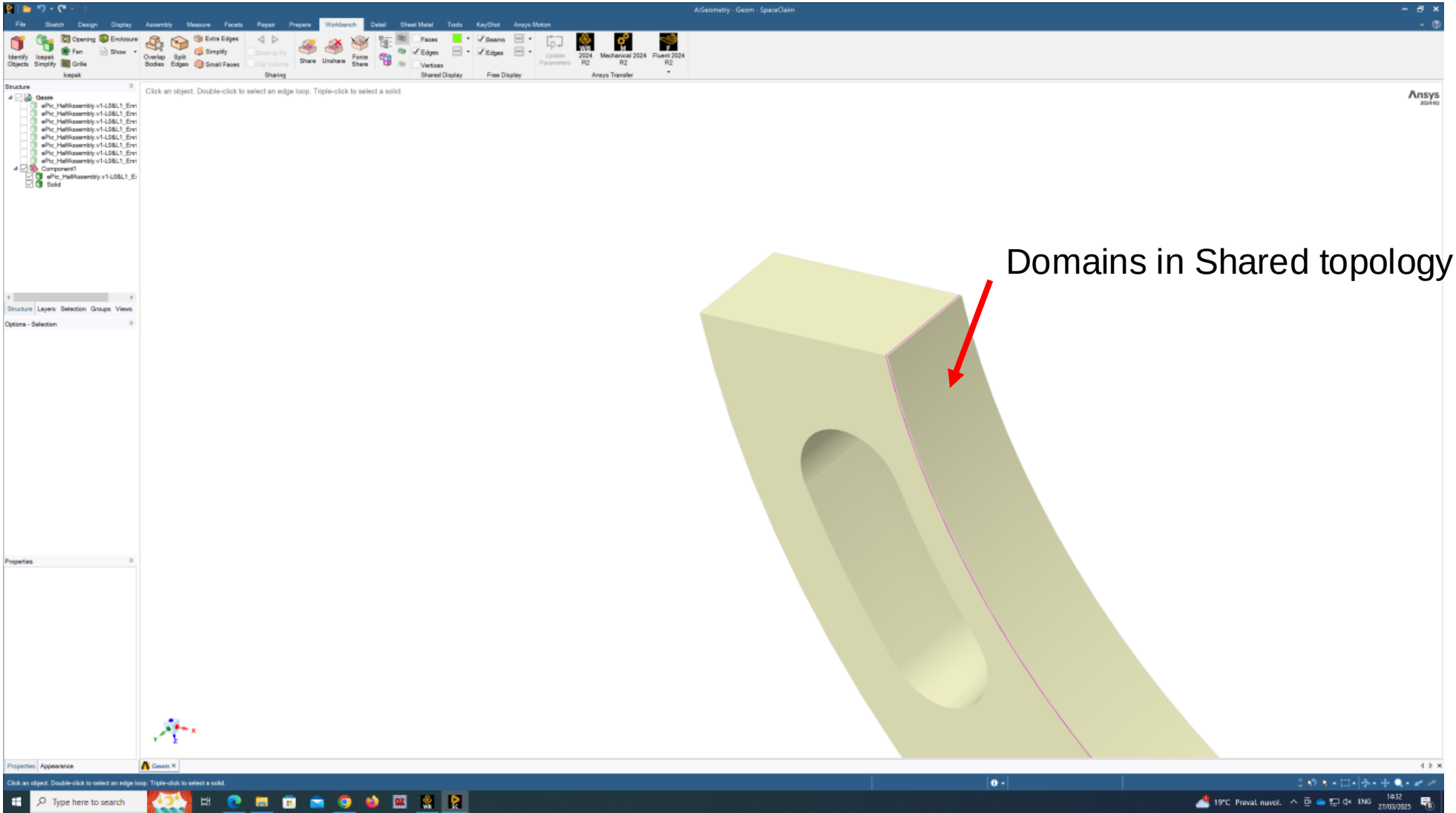
How to include a glue layer to build a connected mesh

Maybe a reconstruction of the geometry in FEA is needed.

To be solved in the SpaceClaim enviroment
Available in Ansys with a Shared Topology strategy



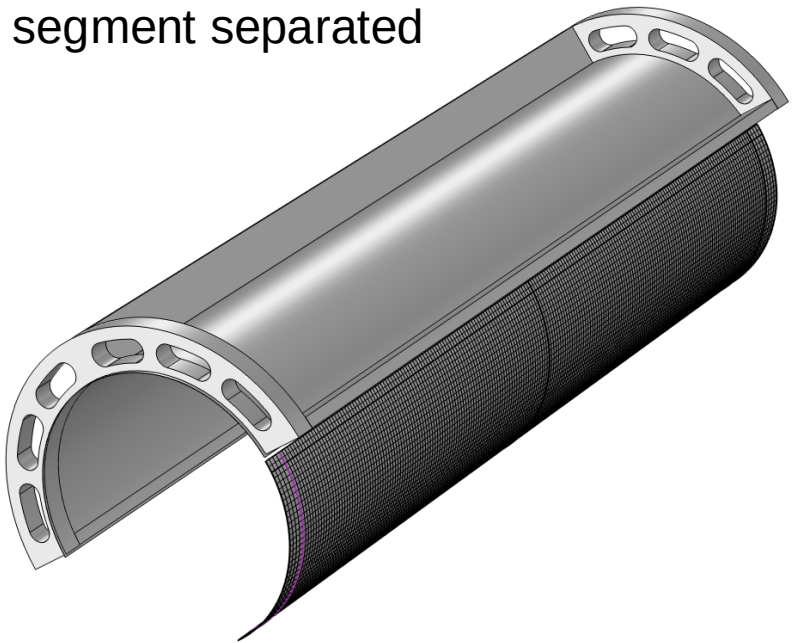


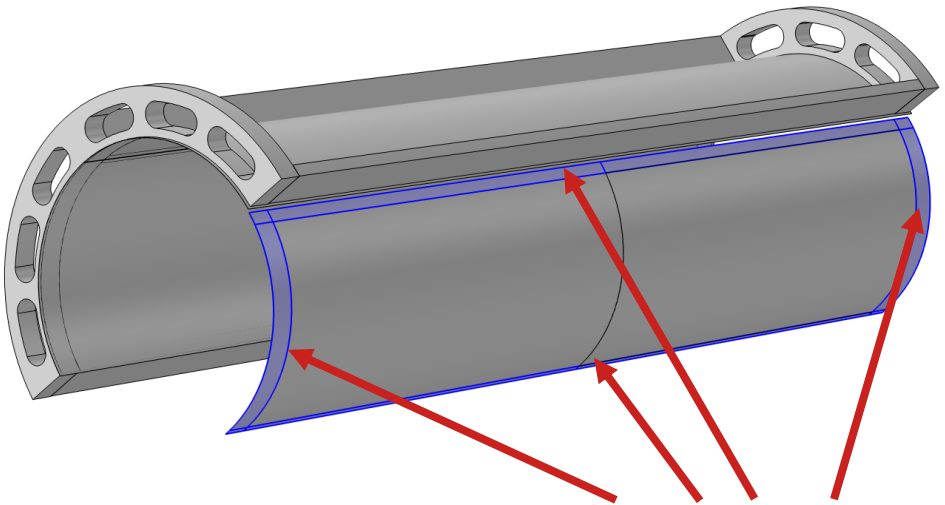

Domains in Shared topology

Modal analysis of a bent silicon foil

Fixed boundary conditions BCs.
Projection of the H-rings and
Longeron surfaces.

Mesh and simulation
of ¼ of silicon layer.
4 segment separated



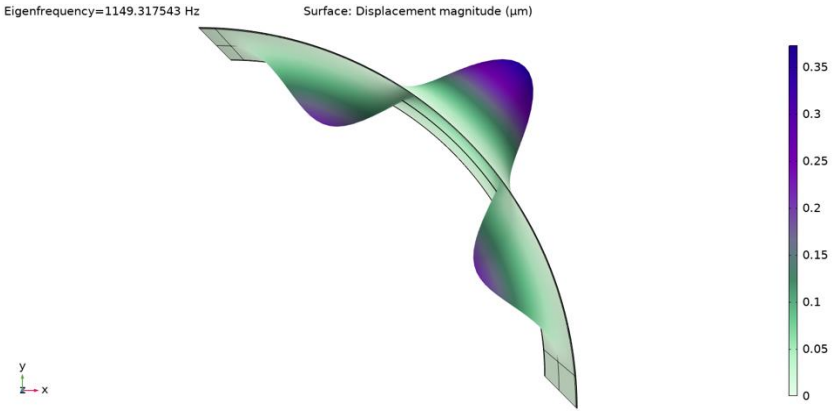


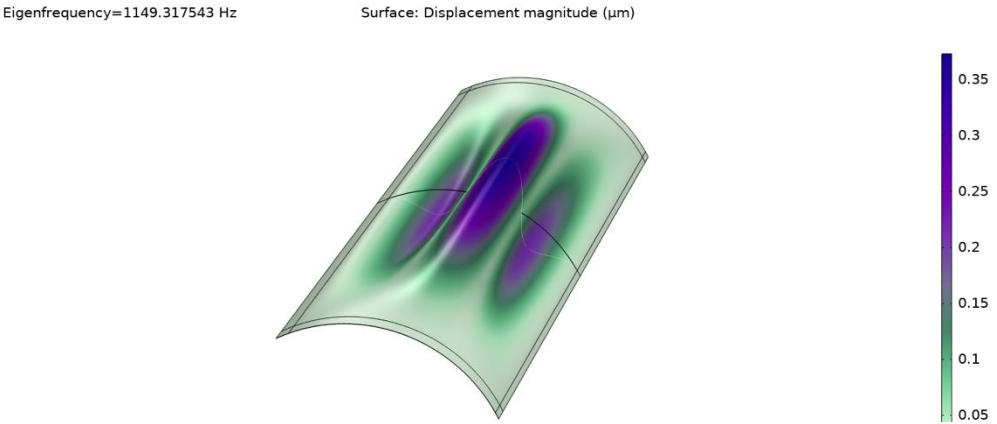
Glued parts BC

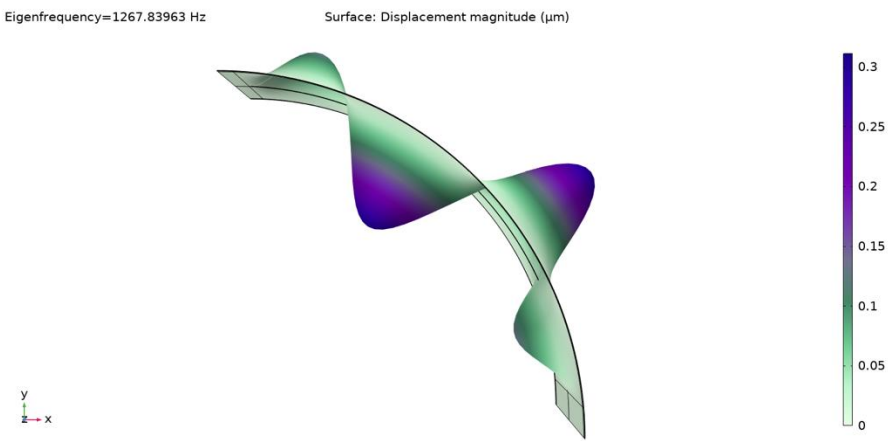
Bending stress is not taken into account.

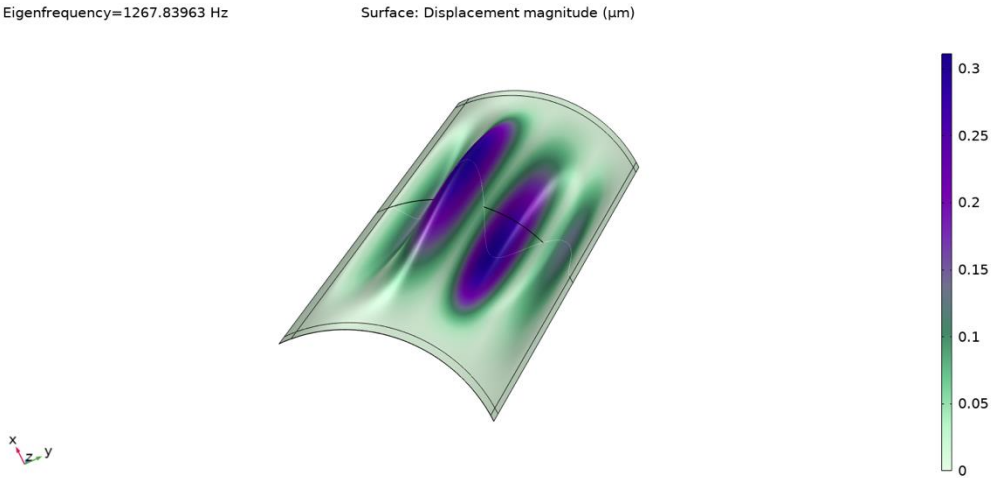
Modal analysis of the silicon foil

Modes above 1k Hz - BCs too rigid?



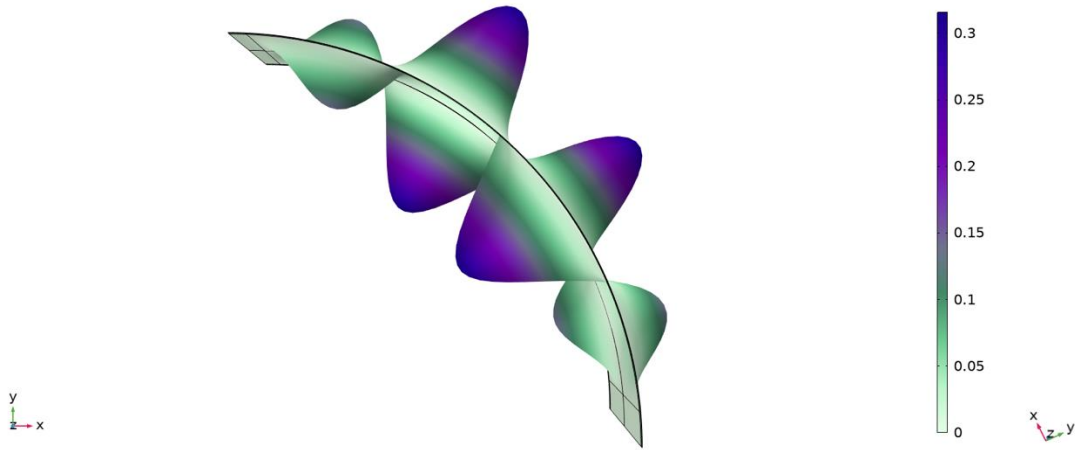






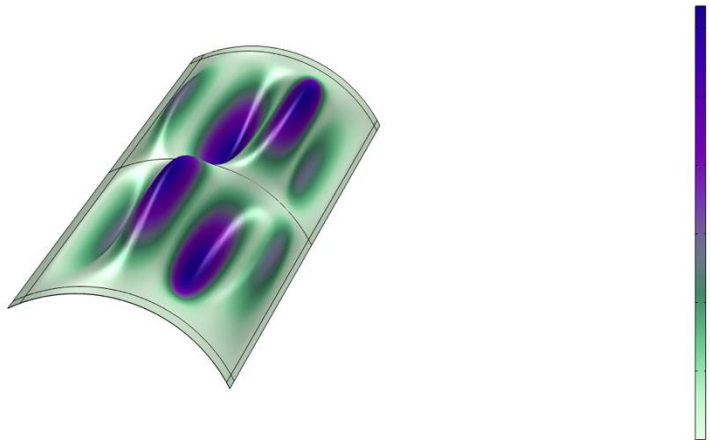
Eigenfrequency=1599.232594 Hz

Surface: Displacement magnitude (µm)



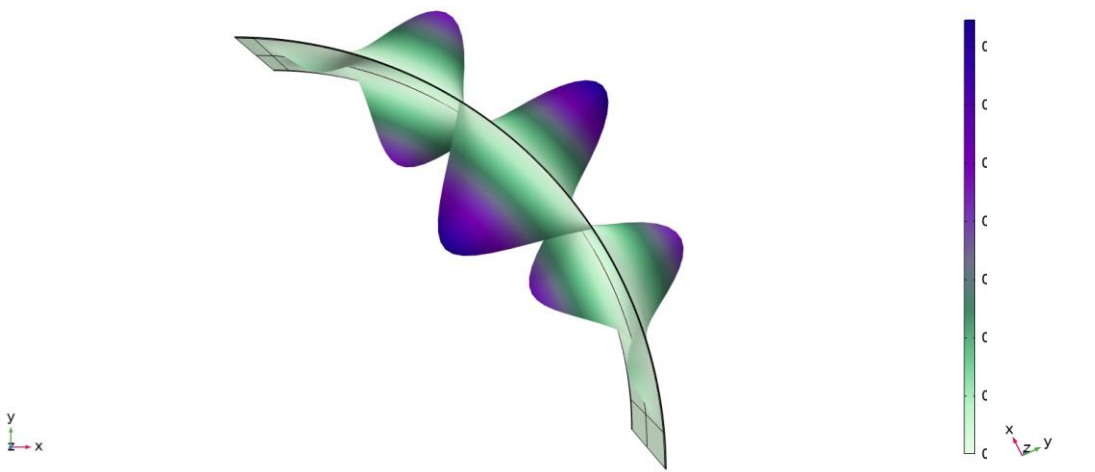
Eigenfrequency=1599.232594 Hz

Surface: Displacement magnitude (µm)



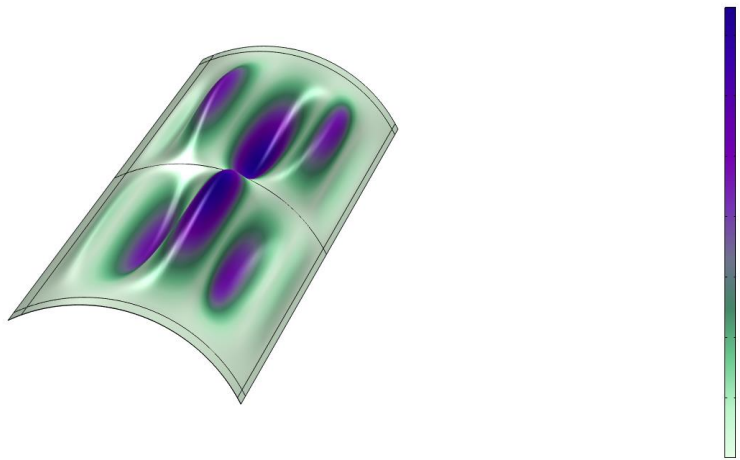
Eigenfrequency=1763.641803 Hz

Surface: Displacement magnitude (µm)



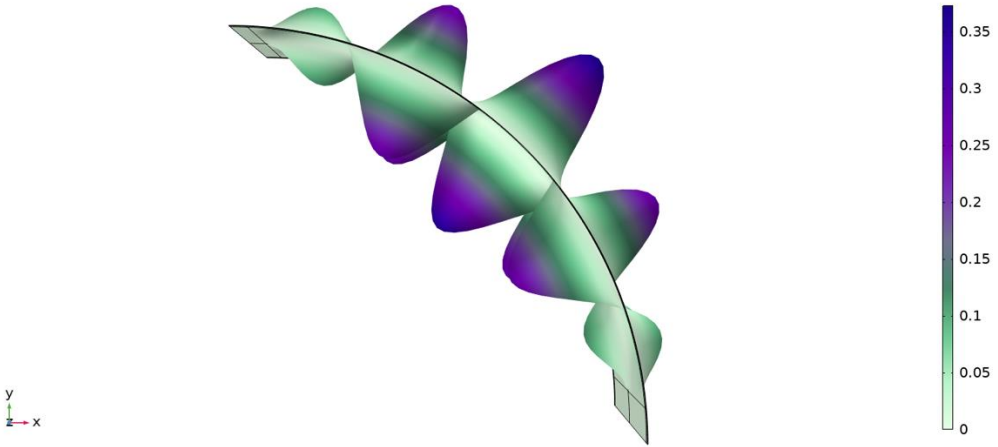
Eigenfrequency=1763.641803 Hz

Surface: Displacement magnitude (µm)



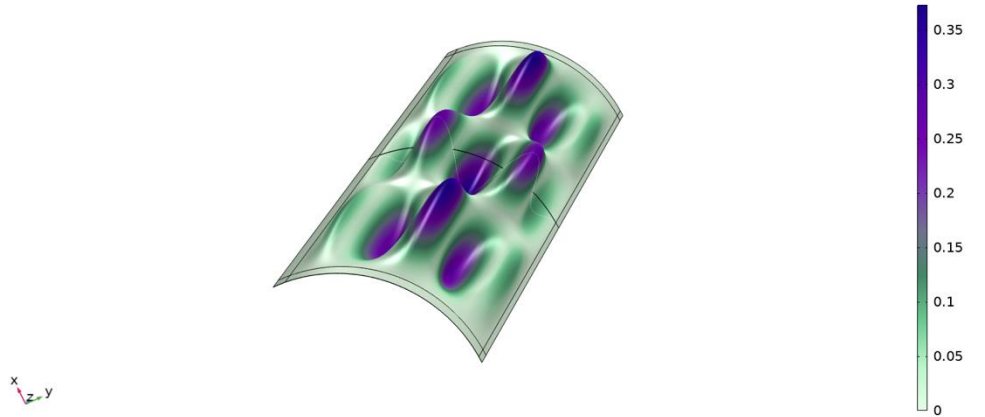
Eigenfrequency=2135.643481 Hz

Surface: Displacement magnitude (μm)



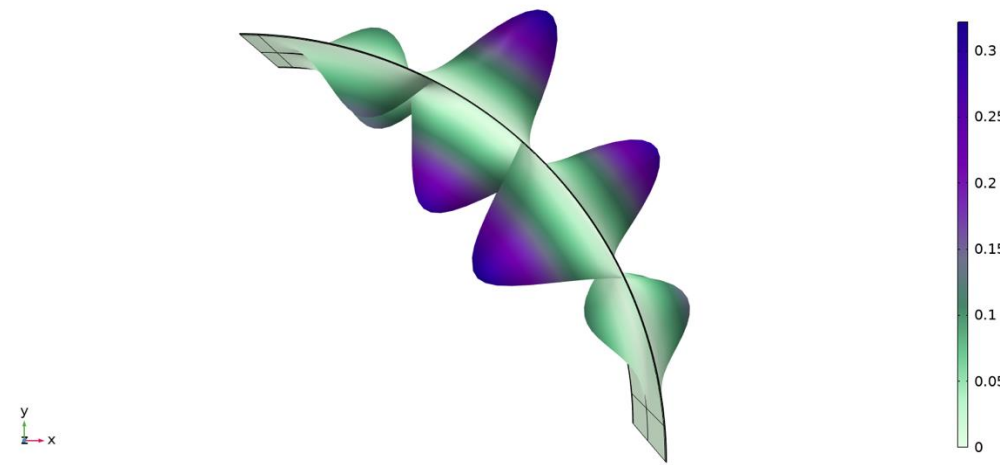
Eigenfrequency=2135.643481 Hz

Surface: Displacement magnitude (μm)



Eigenfrequency=2146.10124 Hz

Surface: Displacement magnitude (μm)



Eigenfrequency=2146.10124 Hz

Surface: Displacement magnitude (μm)