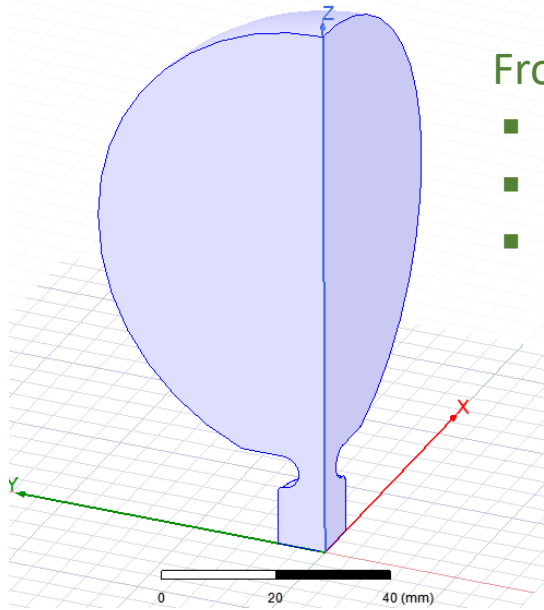


# RF check and preliminary thermal calculation of the CC cavities and RF rotator

Ping Wang, Alexej Grudiev

10.10.2022

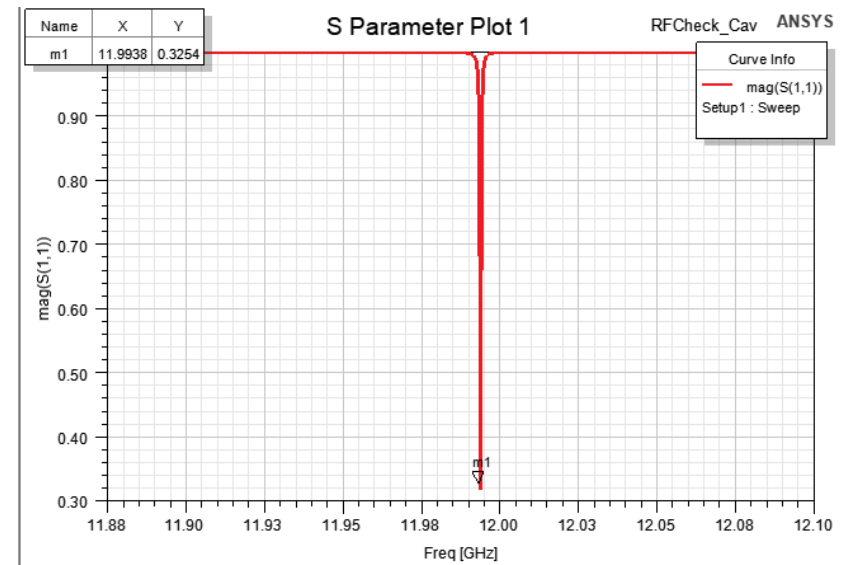
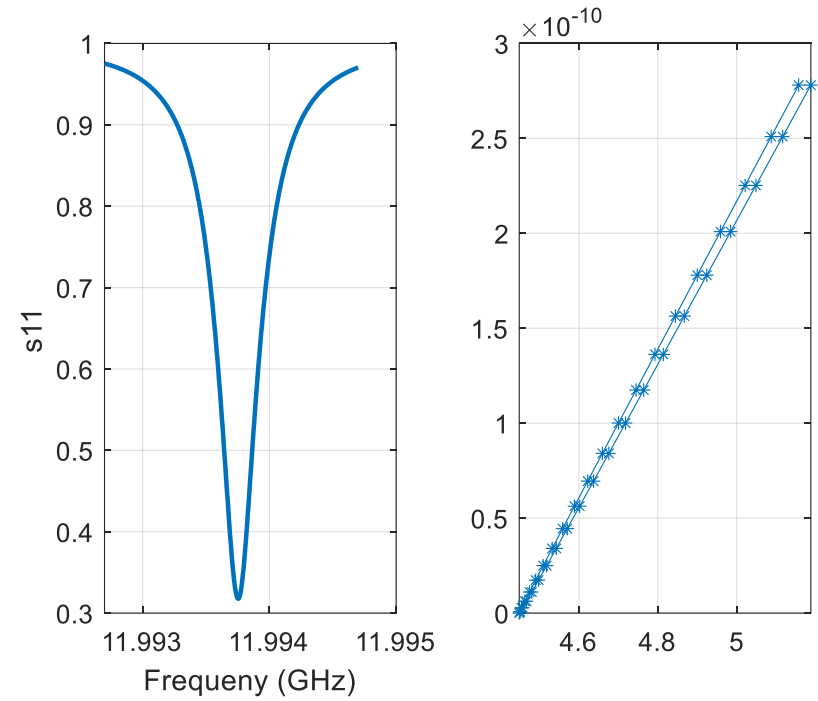
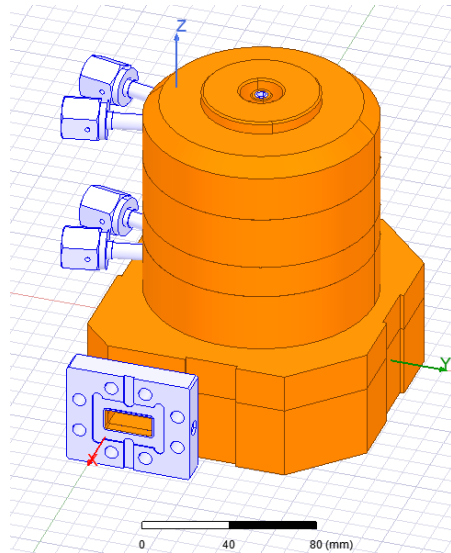
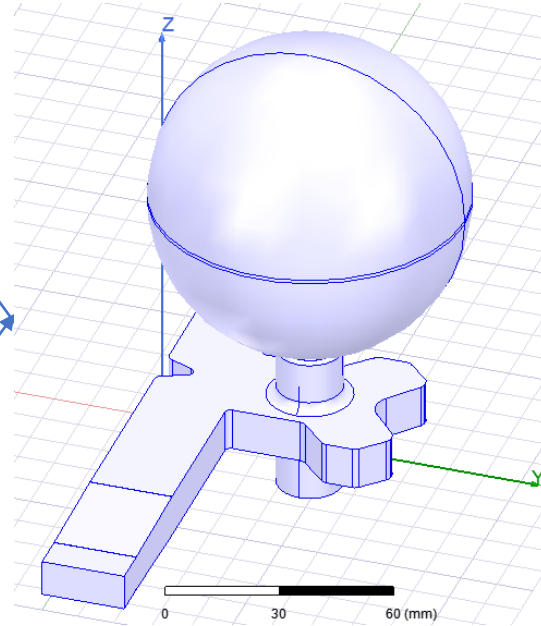
# RF check of the spherical CC



From RF model

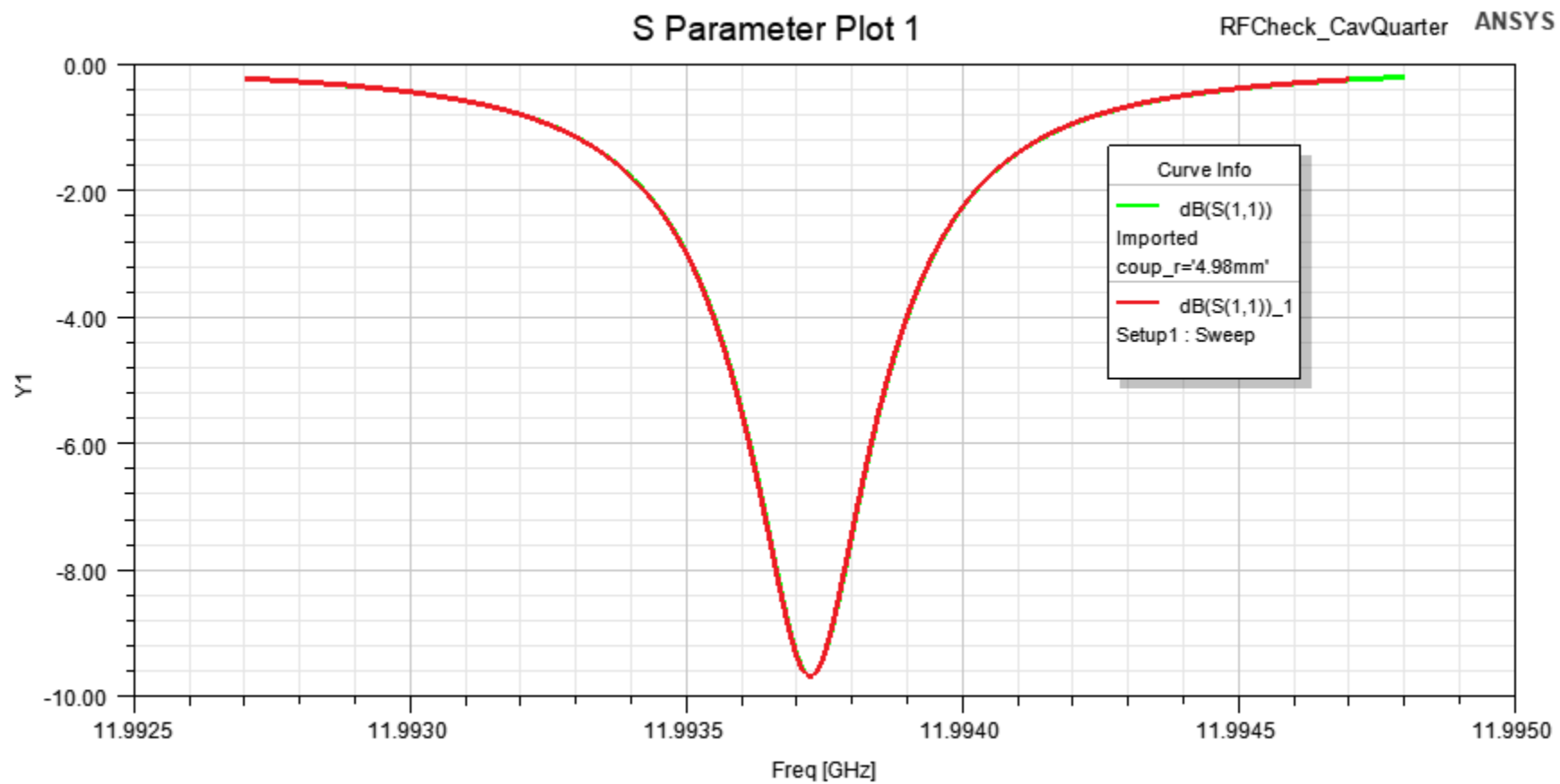
- $f_0 = 11.9937$  GHz
- Beta=1.95
- $Q_0=70936$

- $f_0 = 11.9938$  GHz
- Beta=1.9304
- $Q_0 = 70944.6$

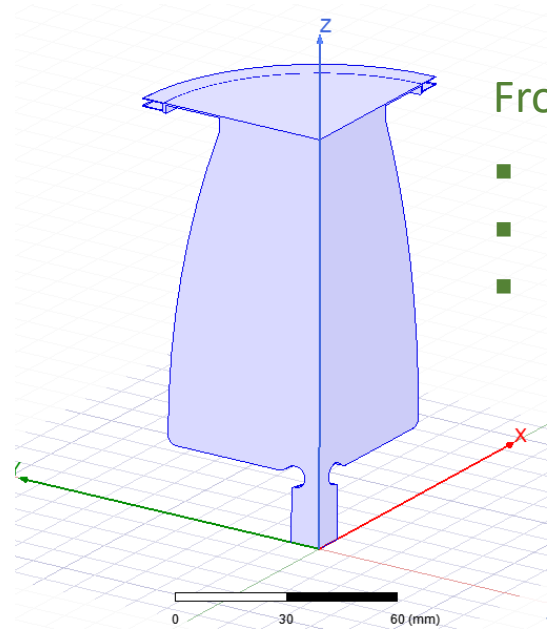


## RF check of the spherical CC

The s11 of RF model and the s11 from mechanical are identical.



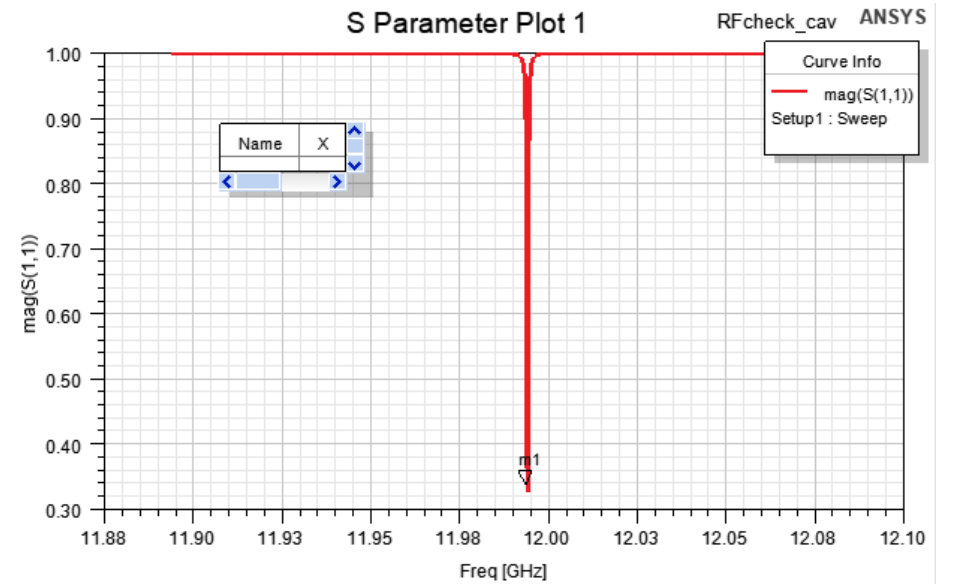
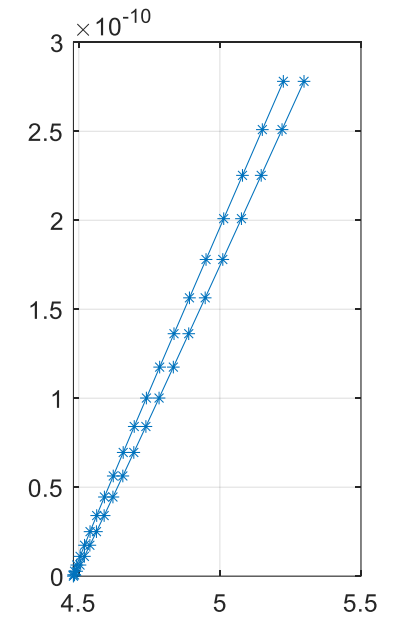
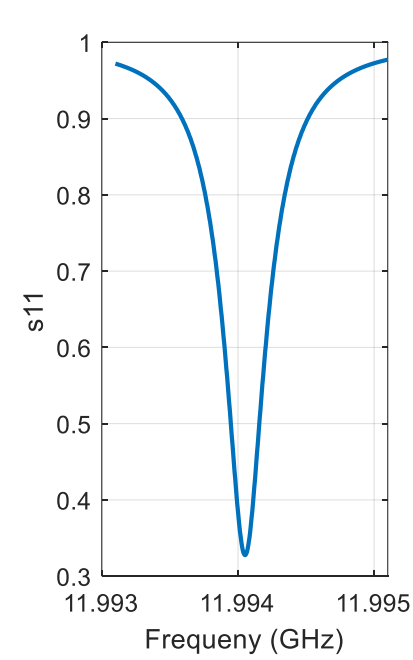
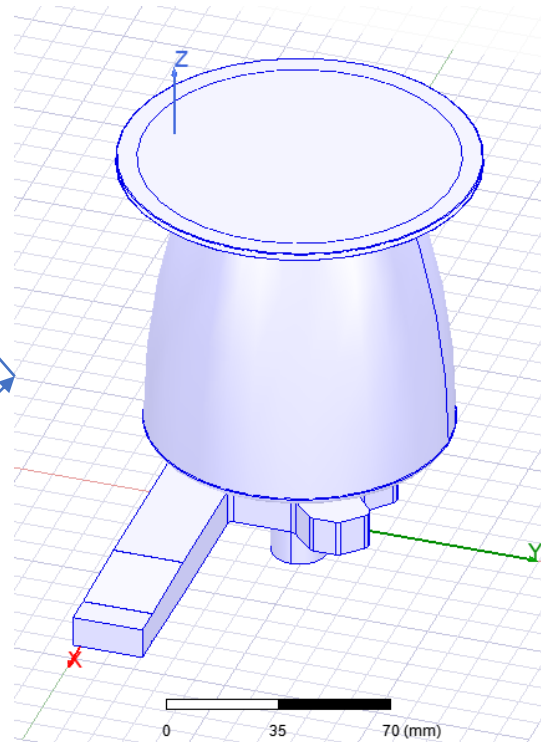
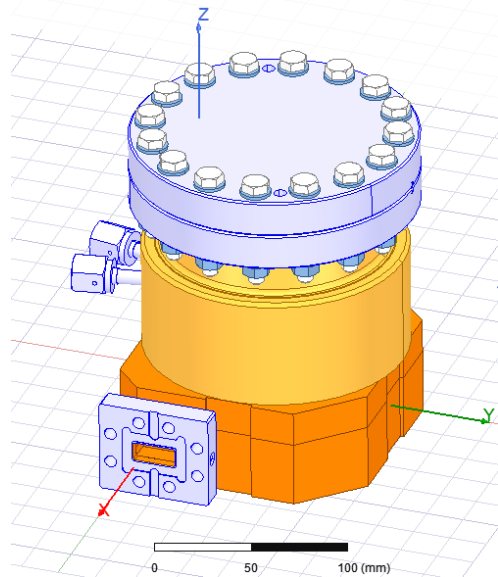
# RF check of the bowl CC



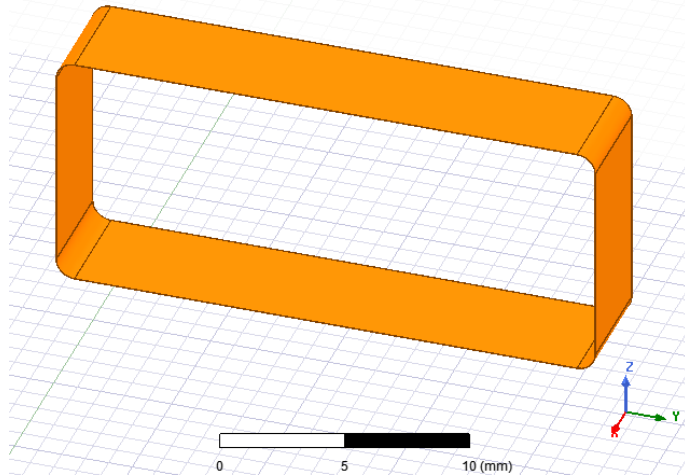
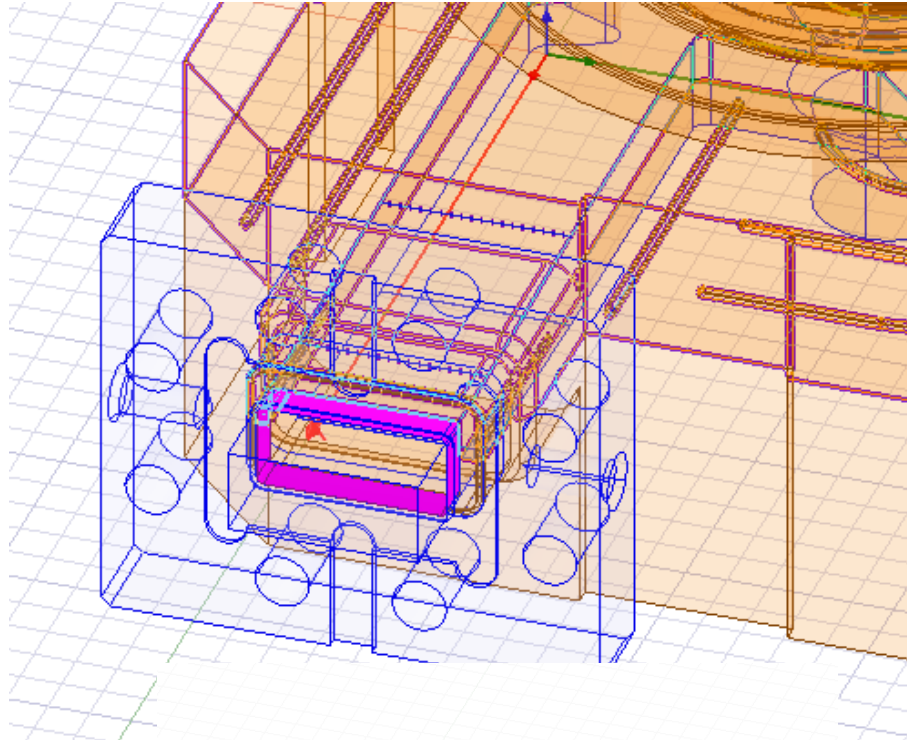
From RF model

- $f_0 = 11.9941$  GHz
- $\text{Beta} = 1.97$
- $Q_0 = 74700$

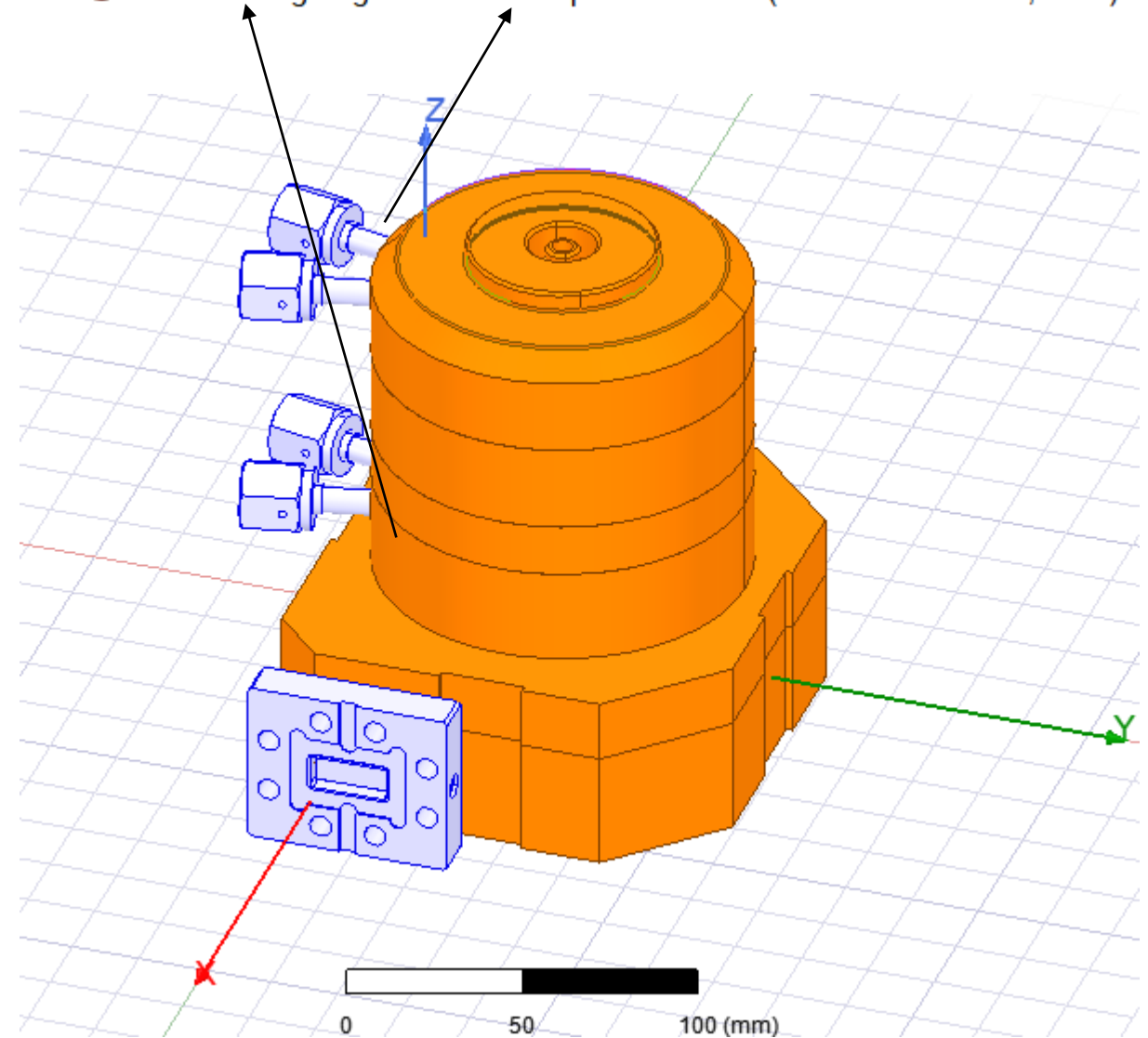
- $f_0 = 11.9941$  GHz
- $\text{Beta} = 1.9717$
- $Q_0 = 74694.5$



## Deleted parts in the mechanical model before the thermal calculation



- Parts "coolingRing1" and "waterPipe4" intersect. (6:24:46 PM Oct 09, 2022)
- Parts "coolingRing1" and "waterPipe3" intersect. (6:24:47 PM Oct 09, 2022)
- Parts "coolingRing2" and "waterPipe2" intersect. (6:24:47 PM Oct 09, 2022)
- Parts "coolingRing2" and "waterPipe1" intersect. (6:24:47 PM Oct 09, 2022)



# Preliminary thermal calculation of the spherical cavity

Parameters of the klystron	
Peak power [MW]	50
Pulse length [ $\mu\text{s}$ ]	2.0
Repetition rate [Hz]	50
Average power [kW]	5.0

