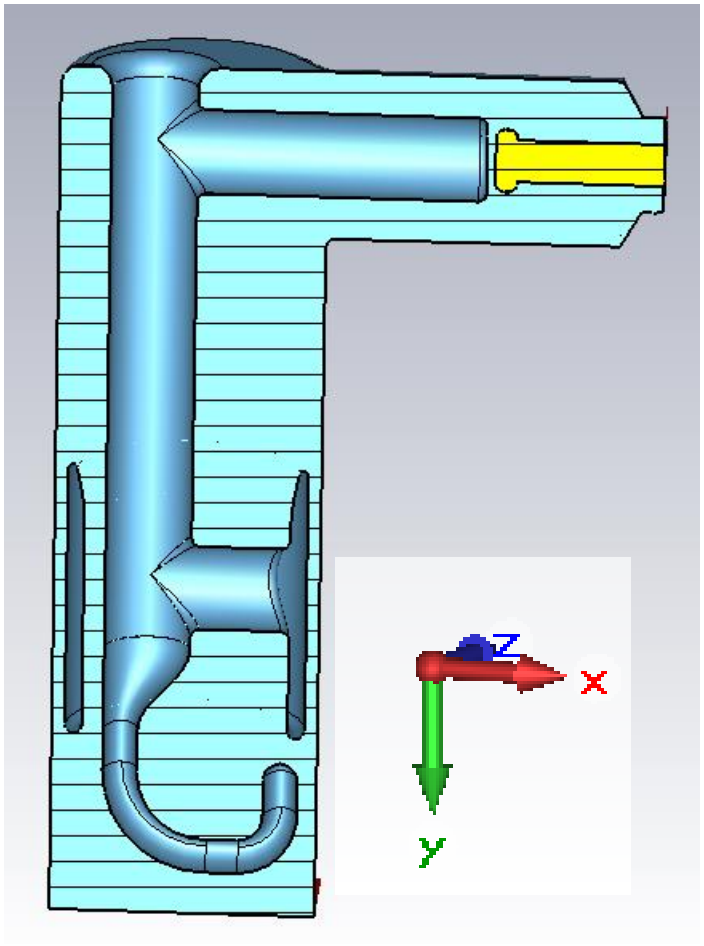
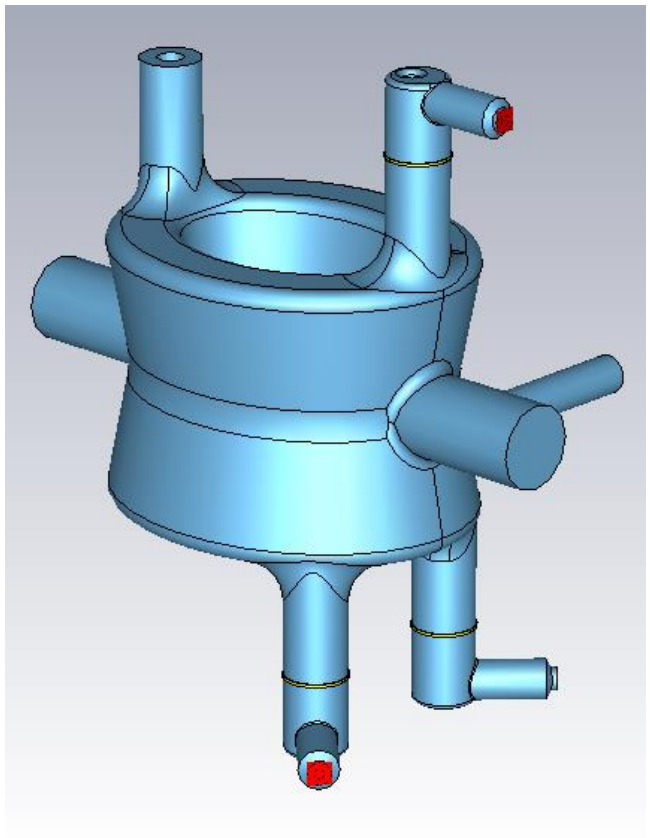
HOM filter

Based on model HOM_BNLv7_6_52mm_parameter.cst

Positions with “-” means moving in -x, -y or -z direction

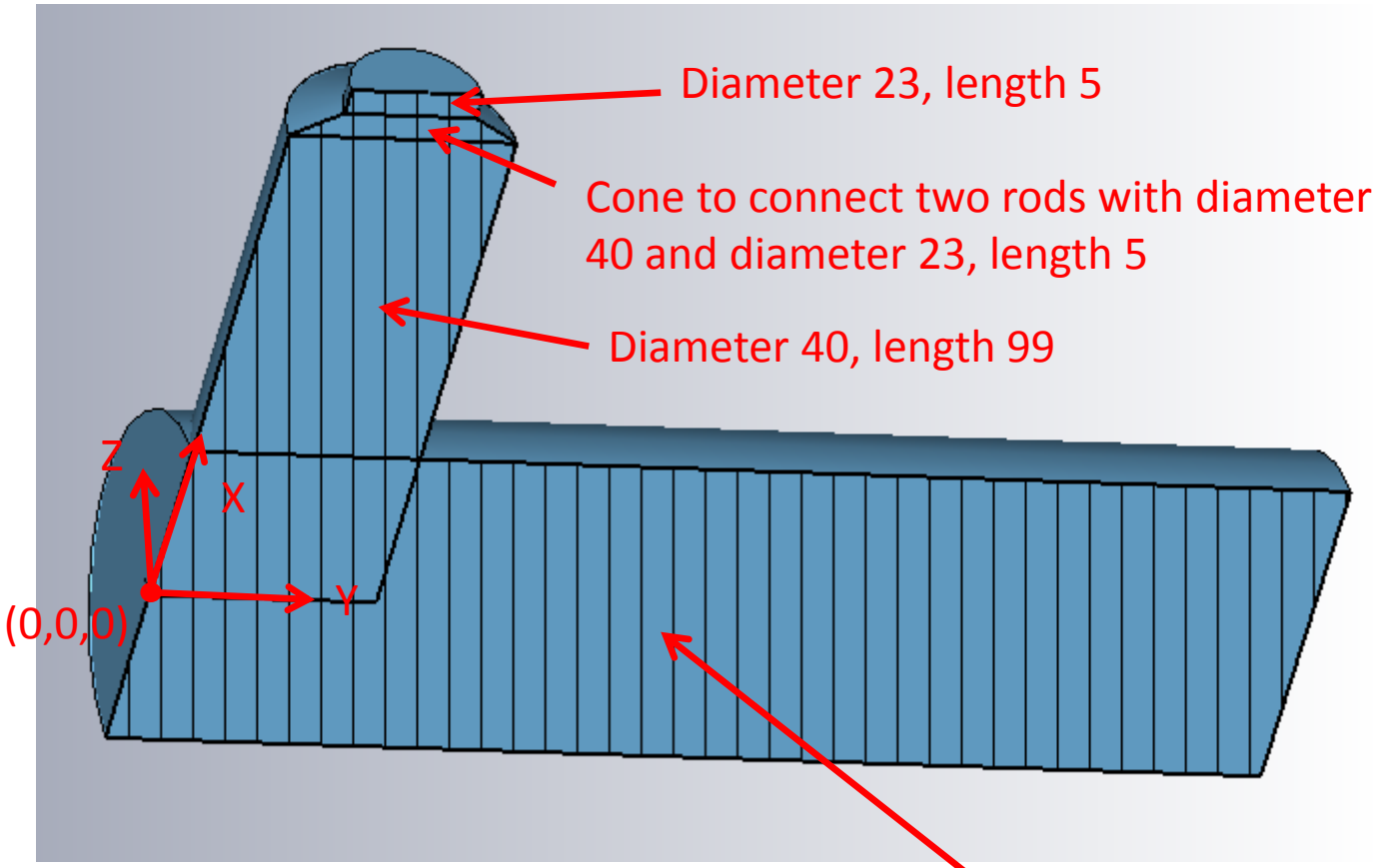




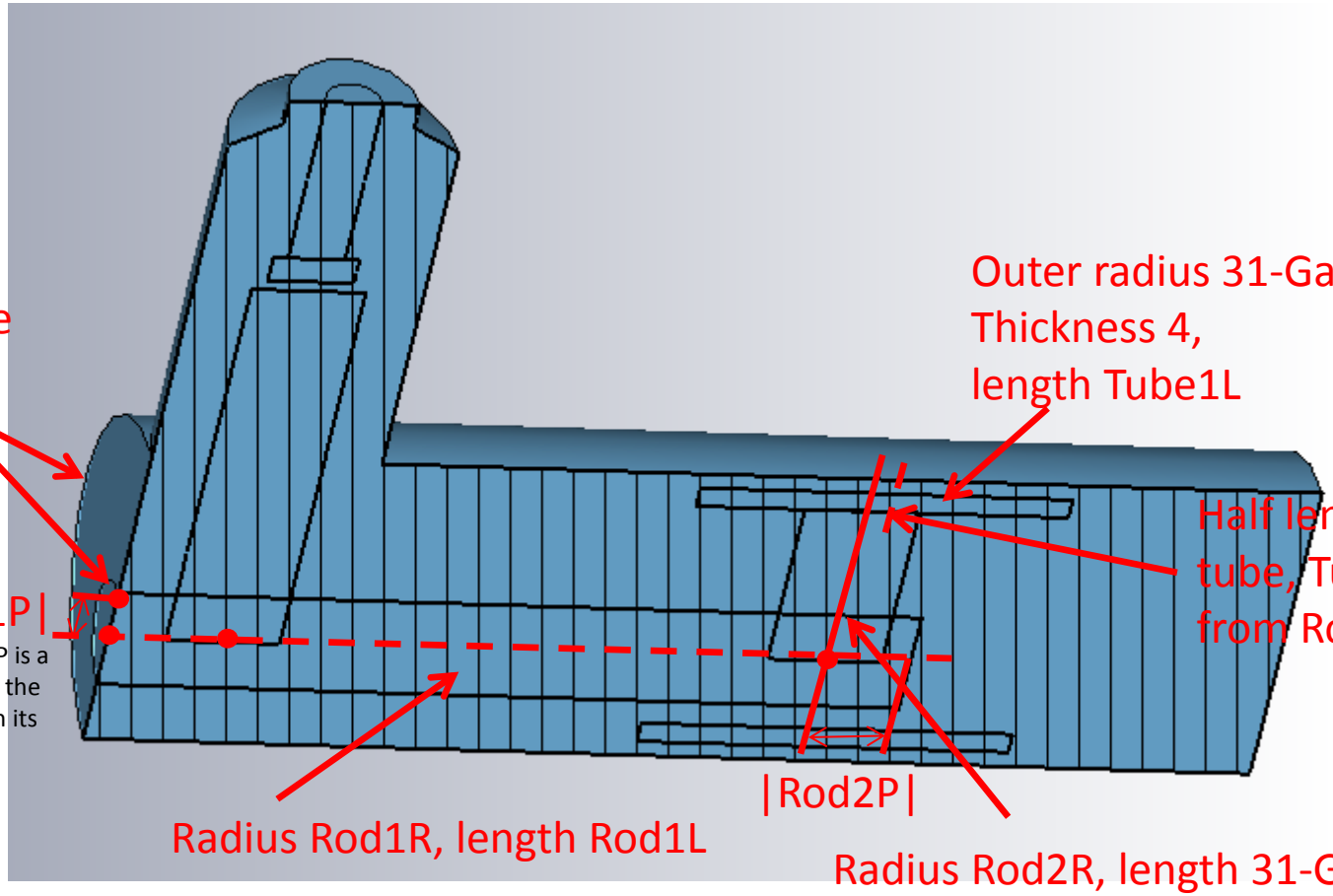
Name /	Value
Gap1	3
Gap2	2
Rod1L	140
Rod1P	-9
Rod1R	10
Rod2P	-15
Rod2R	Rod1R
Rod3L	77
Rod3P	20
Rod3R	Rod1R
Rod4R	7.5
Tube1L	65
Tube1P	3.5
blending2	2
blending30	30
blending5	5
blendingdr	2-conedr/2
coneL	10
conedr	2
hookP1	20
hookP2	10
hookP3	20
hookP4	7.5
hookP5	10
hookP6	9
hookRa	8
hookRb	4

Length unit: mm

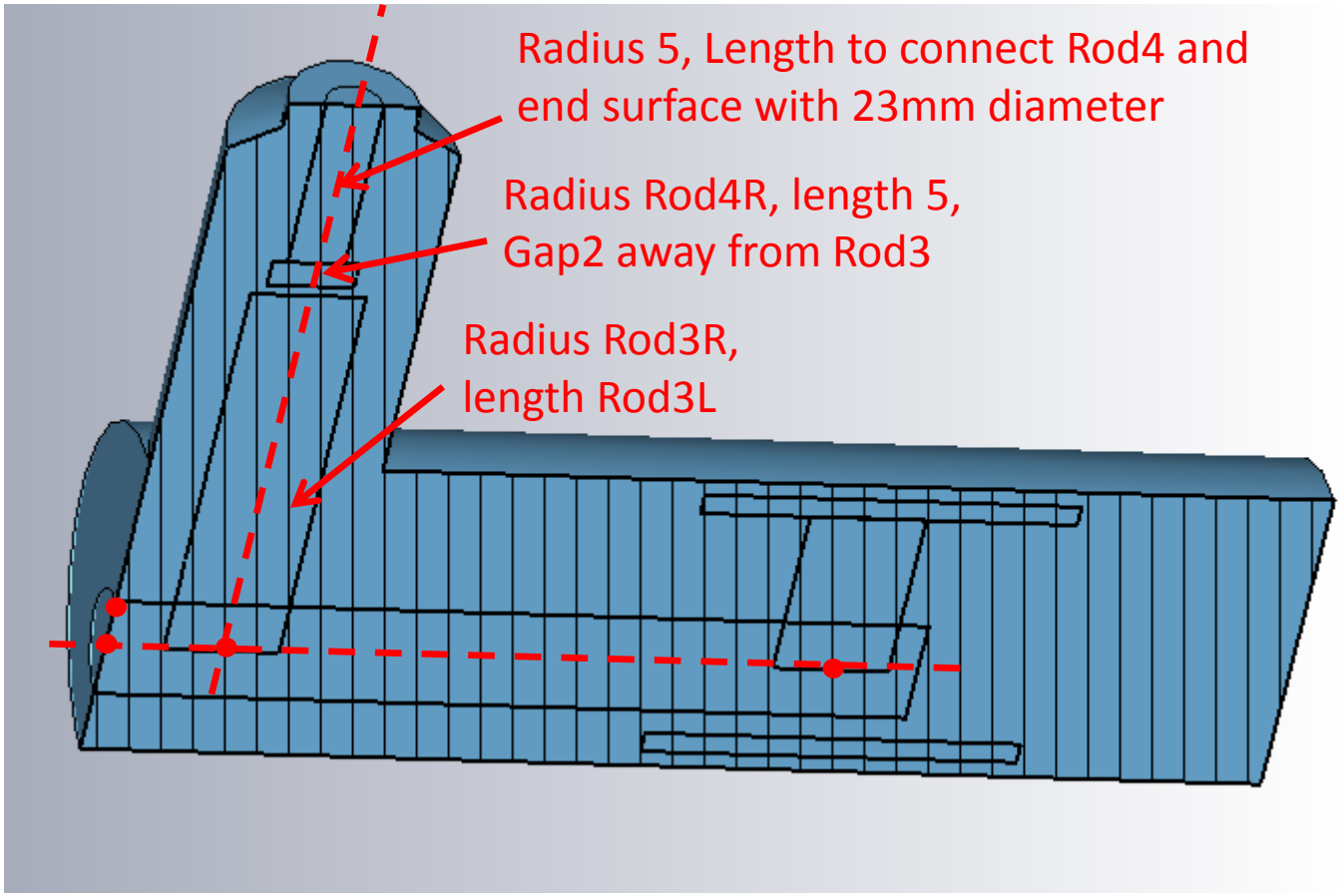
HOM filter-step 1



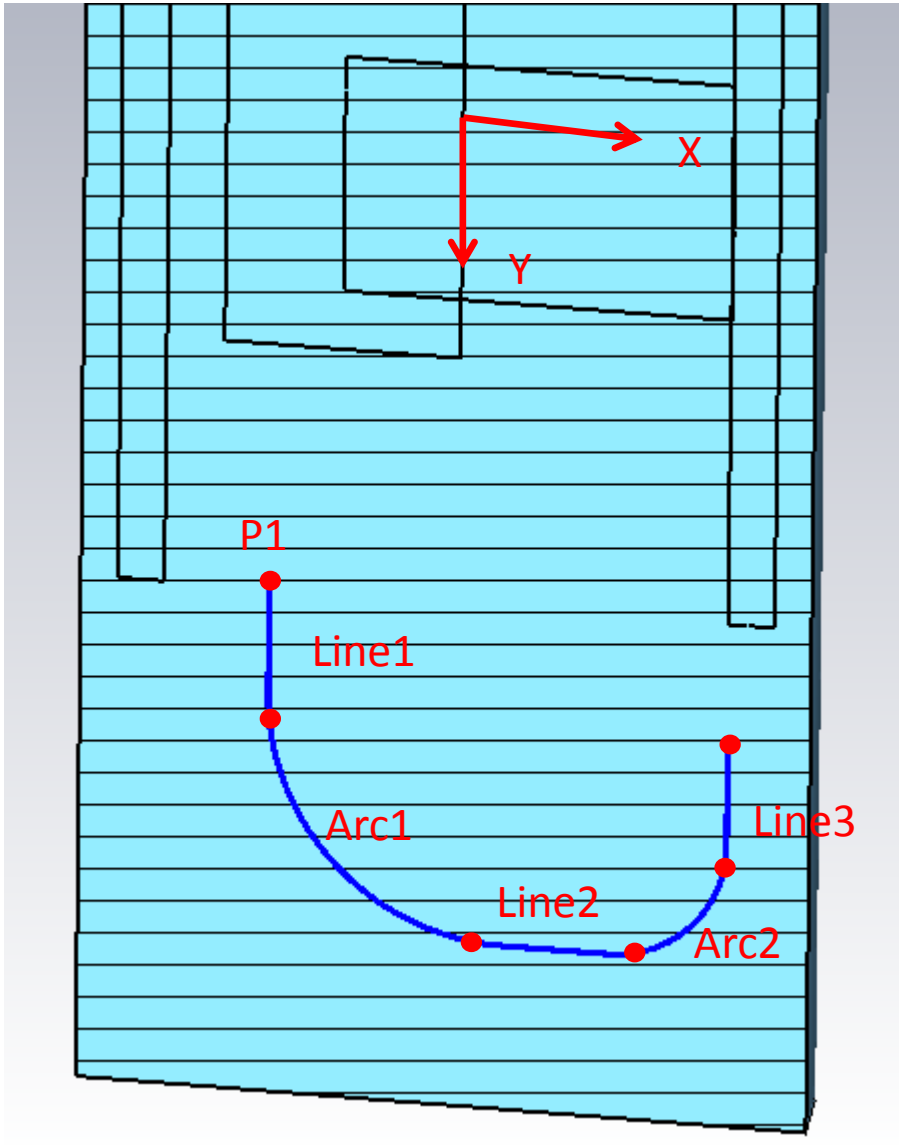
HOM filter-step 2



HOM filter-step 3



HOM filter-step4



Start point P1:
(Rod1P-Rod1R+hookRb,Rod1L+hookP1)

Line1 length: hookP2

Arc1:
Center: (Rod1P+hookP3-Rod1R+hookRb,
Rod1L+hookP1+hookP2), radius:hookP3, 90□

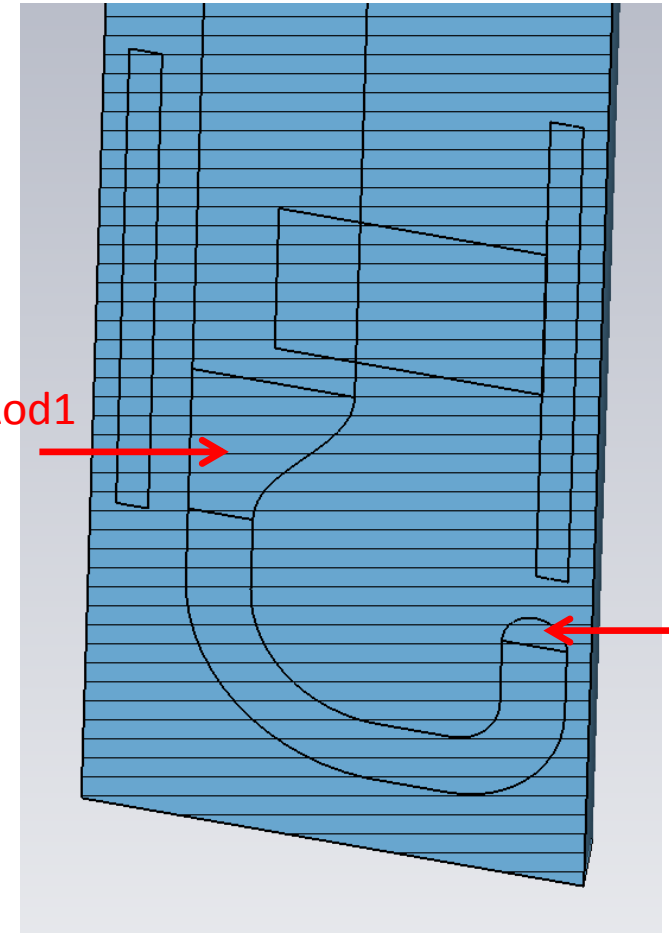
Line2 length: hookP4

Arc2:
Center: (Rod1P+hookP3+hookP4-Rod1R+hookRb,
Rod1L+hookP1+hookP2+hookP3-hookP5),
radius: hookP5, 90□

Line3 length: hookP6

Sweep along this curve to form the hook with elliptical radii hookRa (z direction), hookRb (x direction)

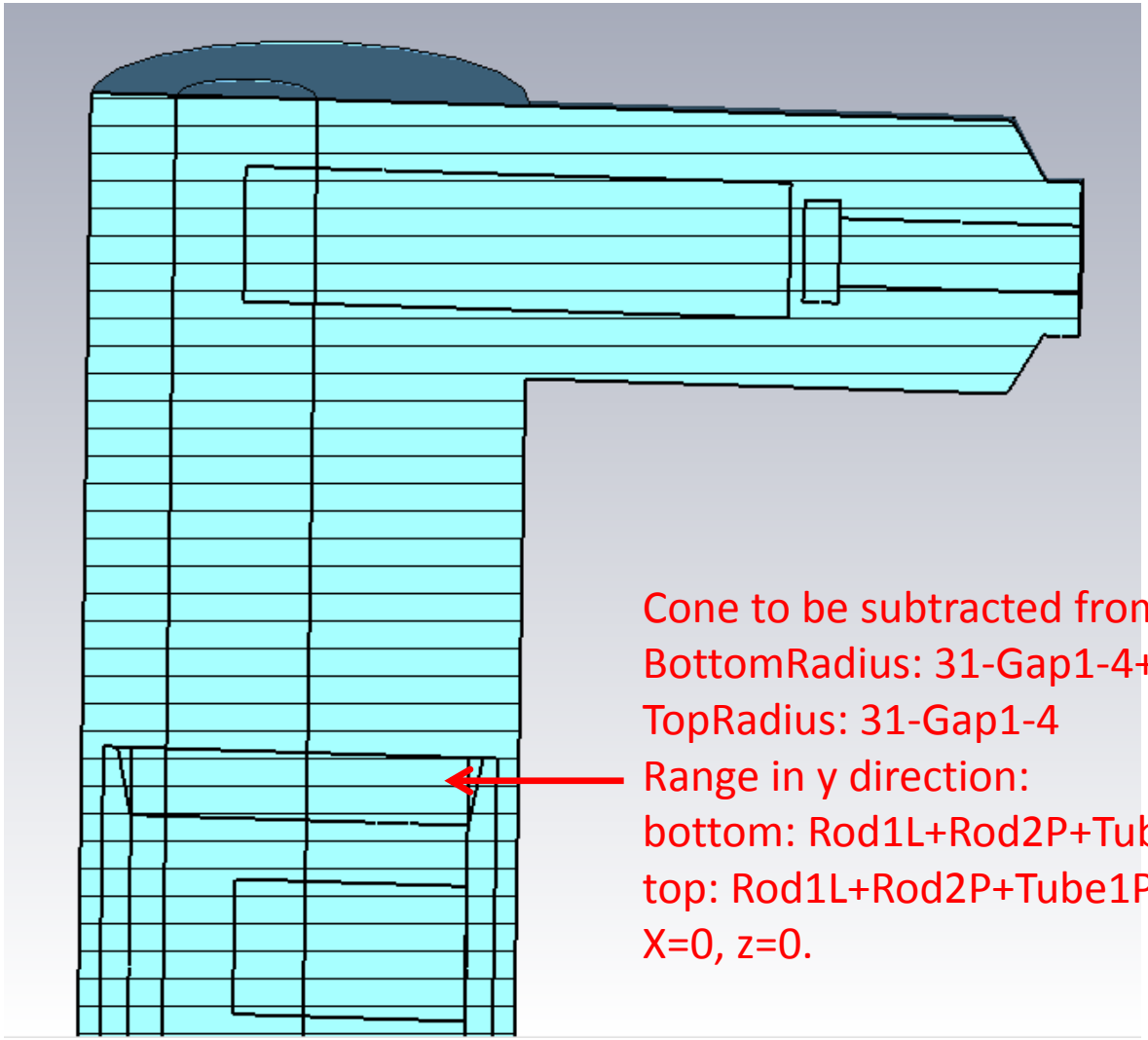
HOM filter-step5



Loft to connect the end of Rod1 to the hook, tangency 0.2

Ellipsoid (half) with radii:
hookRb (x direction),
hookRb (y direction),
hookRa (z direction)

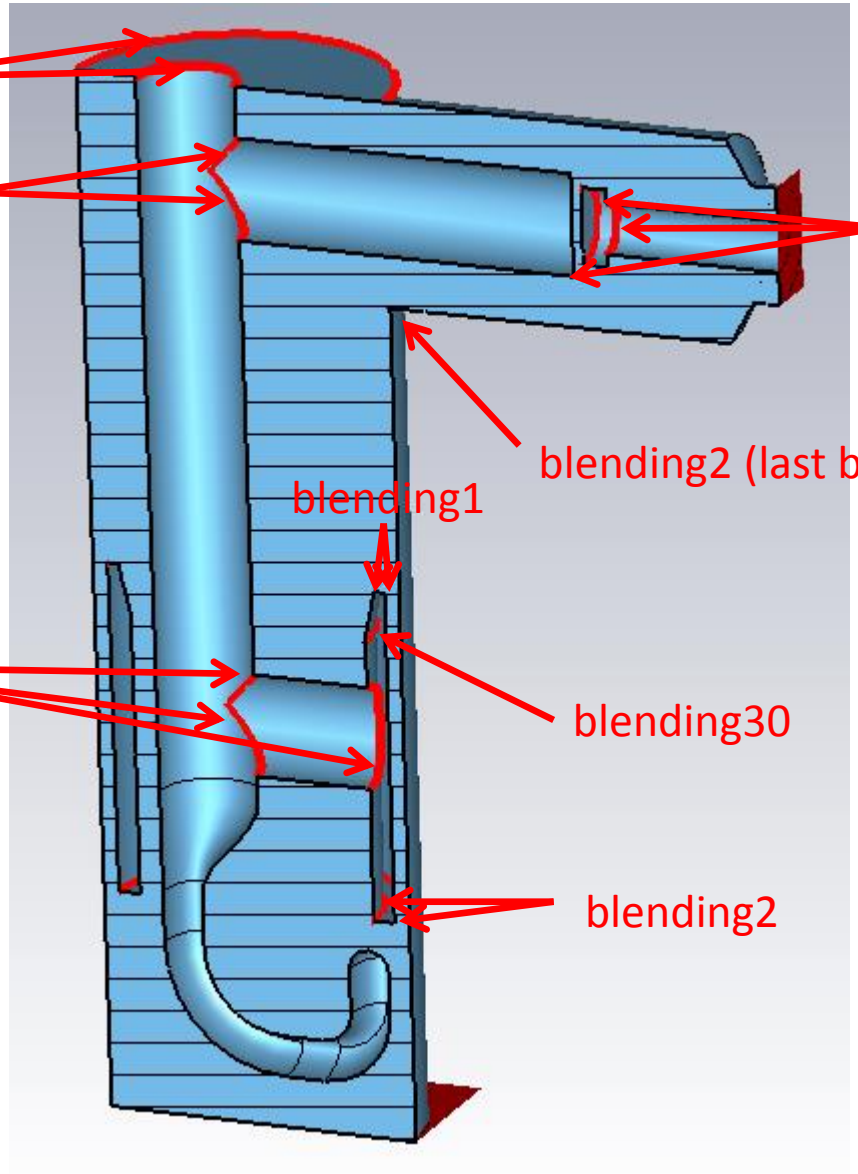
HOM filter-step6



Cone to be subtracted from the metal part:
BottomRadius: 31-Gap1-4+dr
TopRadius: 31-Gap1-4
Range in y direction:
bottom: Rod1L+Rod2P+Tube1P-Tube1L/2
top: Rod1L+Rod2P+Tube1P-Tube1L/2+coneL
X=0, z=0.

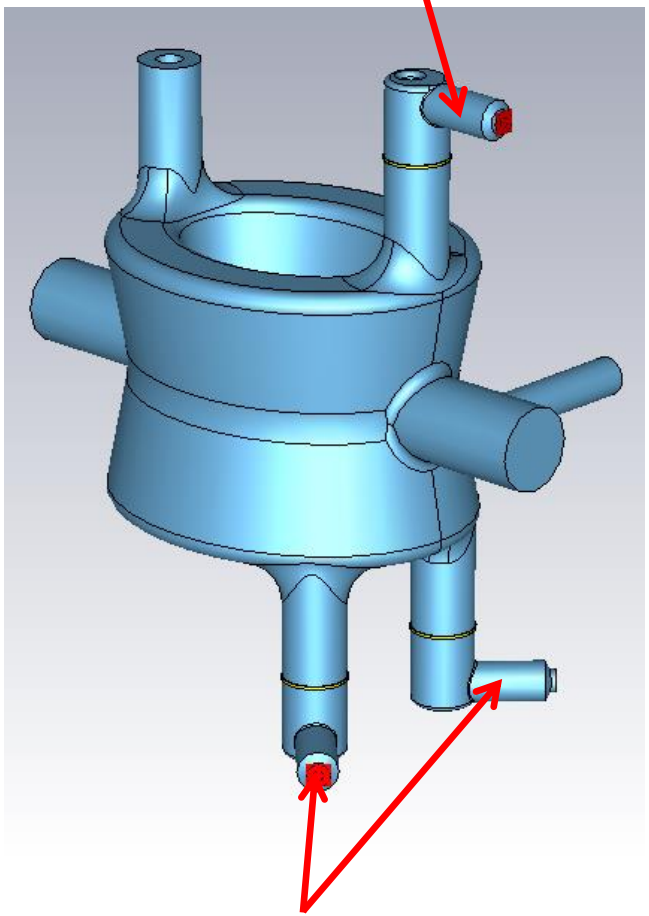
HOM filter-step6

Subtract the metal part from the vacuum part and do blending, with blending radii shown below

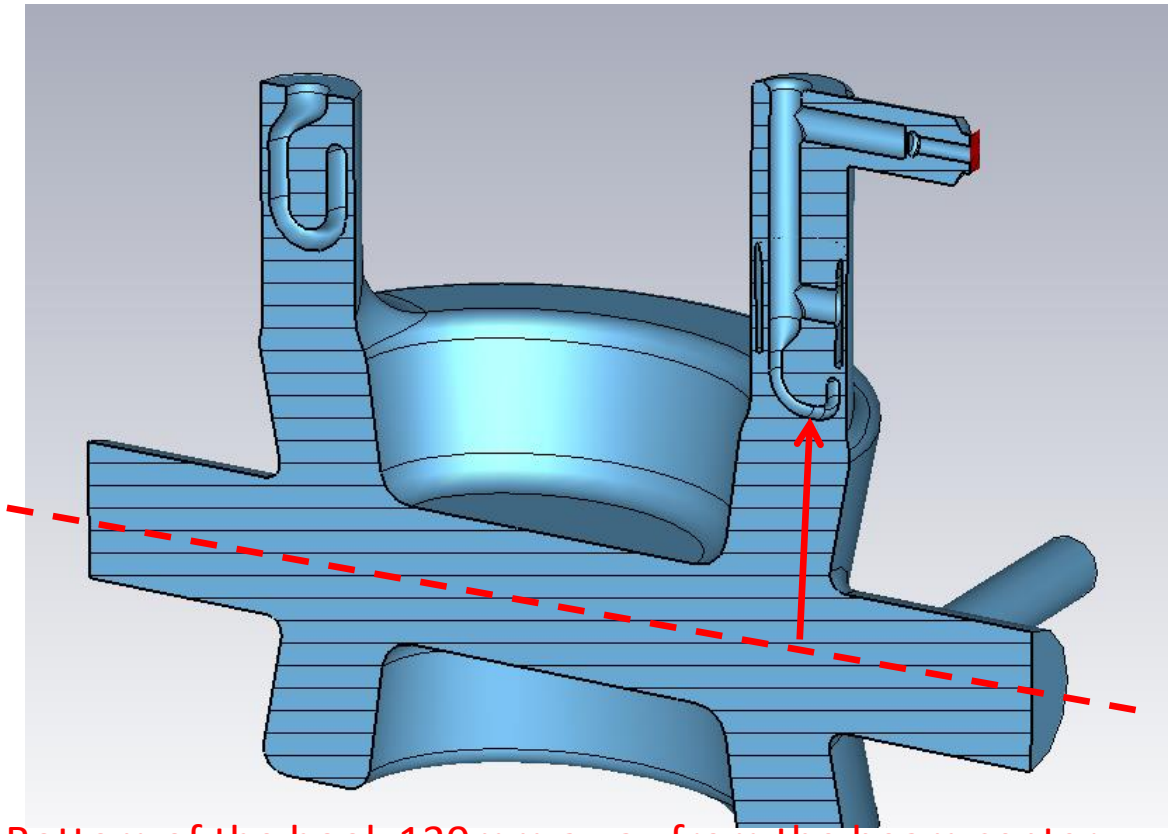


HOM filter-integrating to cavity

Parallel to beam pipe



45□ to beam pipe



Bottom of the hook 139mm away from the beam center (for all 3 filters)