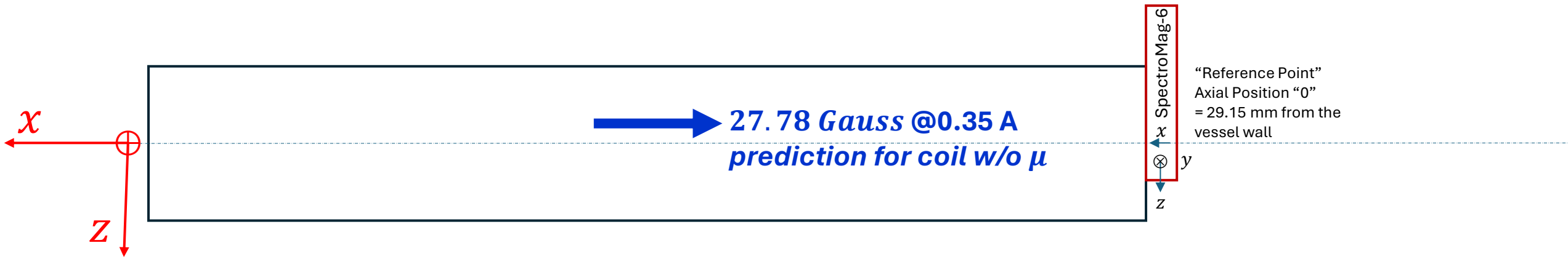
Agenda

1. Lisa on GP-SANS time allocation for nTMM in May 27-30	Lisa
2. study of mu-metal magnetization effect	Yuri
3. X-mas break at UT	Yuri
4. Preparation for December 17 meeting at ORNL	all
5. Any other issues	

Top view

mu-metal magnetization effect studied with

DS Magnet-2 US



M2DGDS coil

M2DG coil for cylindrical part of mu-metal

M2DGUS coil

Field in the room

$B_x = 13.2\mu T\ (\pm 0.5\mu T)$ 10-14 μT

$B_y = 26.1\mu T\ (\pm 0.25\mu T)$

$B_z = 13.8\mu T\ (\pm 0.03\mu T)$

$B_{tot} = 32.3\mu T$

December 09, 2024 SV, YK

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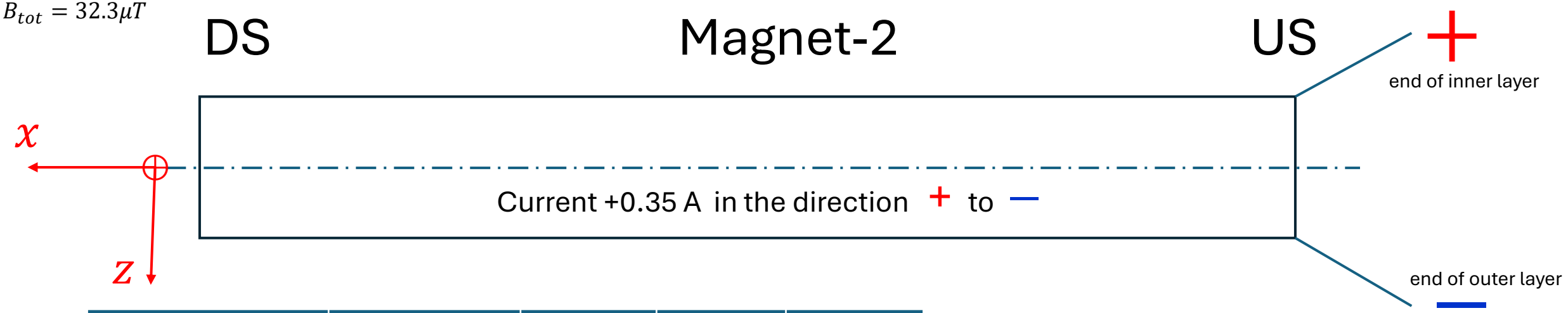
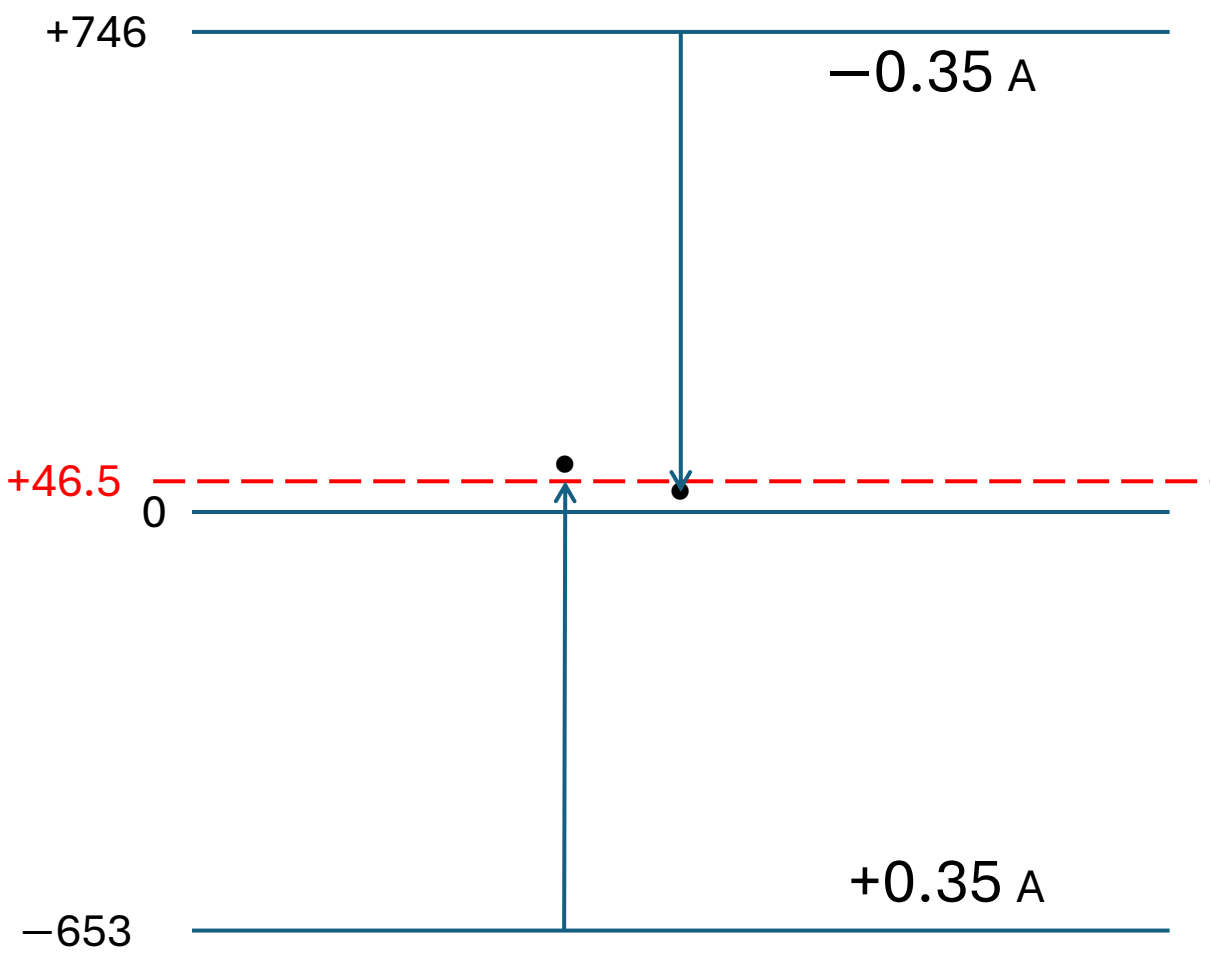


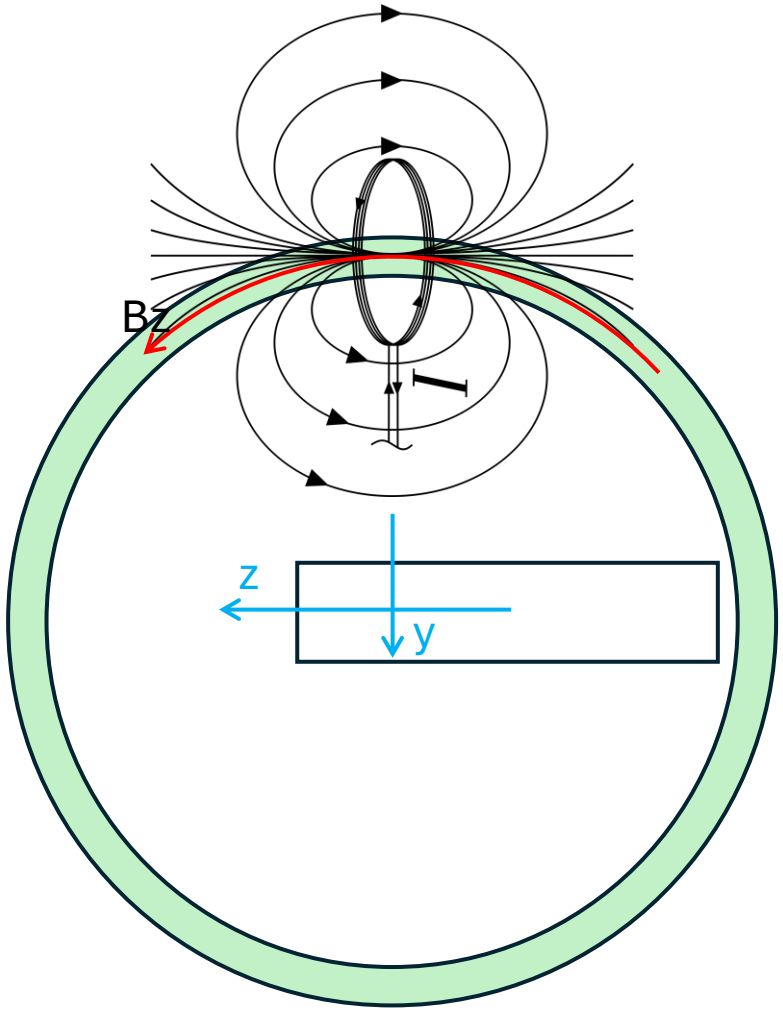
Side	Current	Bx	By	Bz
US (90x90)	+0.35 A	-653	+11.57	+170
US (90x90)	0 A	+63.78	+7.67	+8.1
US (90x90)	−0.35 A	+746.2	+4.5	-118.9
US (90x90)	0 A	+40	8.66	7.96
DS (120x 120)	+0.35 A	-847	+5.5	-111.9
DS (120x 120)	0 A	73.3	9.1	2.2
DS (120x 120)	−0.35 A	960	13	116
DS (120x 120)	0 A	52	8.8	3.2

1. Residual Magnetization of μ –metal
2. It is not affected much by DG
3. Seems to be an effect of magnetization by the Bx component in the Room
4. Different residual magnitudes probably can be equalized by DG of the solenoidal coil (UKY circuit)



$13.2\ \mu T\ \rightarrow\ \sim 51.9 \mu T$

Our accuracy goal $\pm 2\ \mu T$



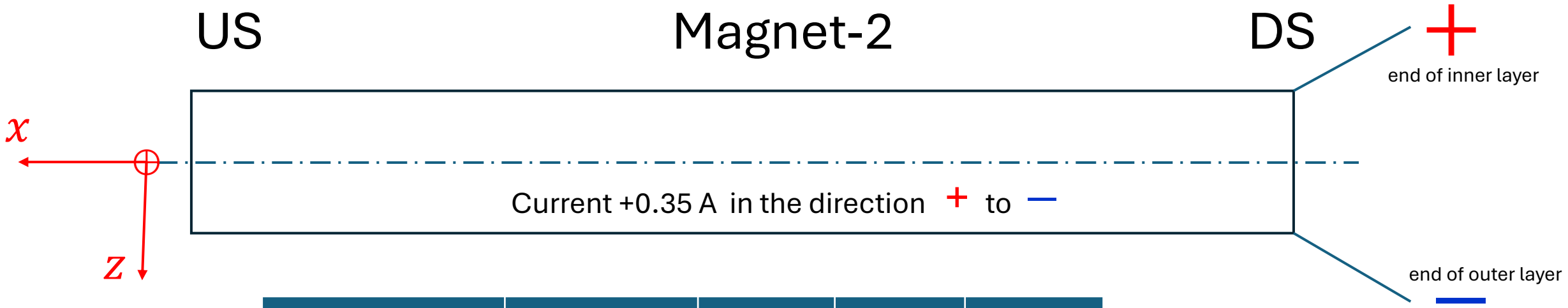
Upstream view

- Our degaussing circuit degausses Z and Y components but major X component (along the magnet) is not degaussed.

- Our degaussing can be performed with magnet current OFF, but Earth magnetic field will be always present.

- Can magnetization be calculated via COMSOL software?

To test this the magnet was rotated in the room US ⇆ DS



Side	Current	Bx	By	Bz
US (90x90)	+0.35 A	-759	9.42	140.5
US (90x90)	0 A	-48.2	8.22	-7.1
US (90x90)	−0.35 A	650	8.3	-155.5
US (90x90)	0 A	-74.7	9.3	-7.4
DS (120x 120)	+0.35 A	+890	5	-157.5
DS (120x 120)	0 A	50.7	7.77	7.64
DS (120x 120)	−0.35 A	-779	10.69	174.7
DS (120x 120)	0 A	75.6	7.48	8.7

rotated magnetometer