Update on Target Vacuum Can

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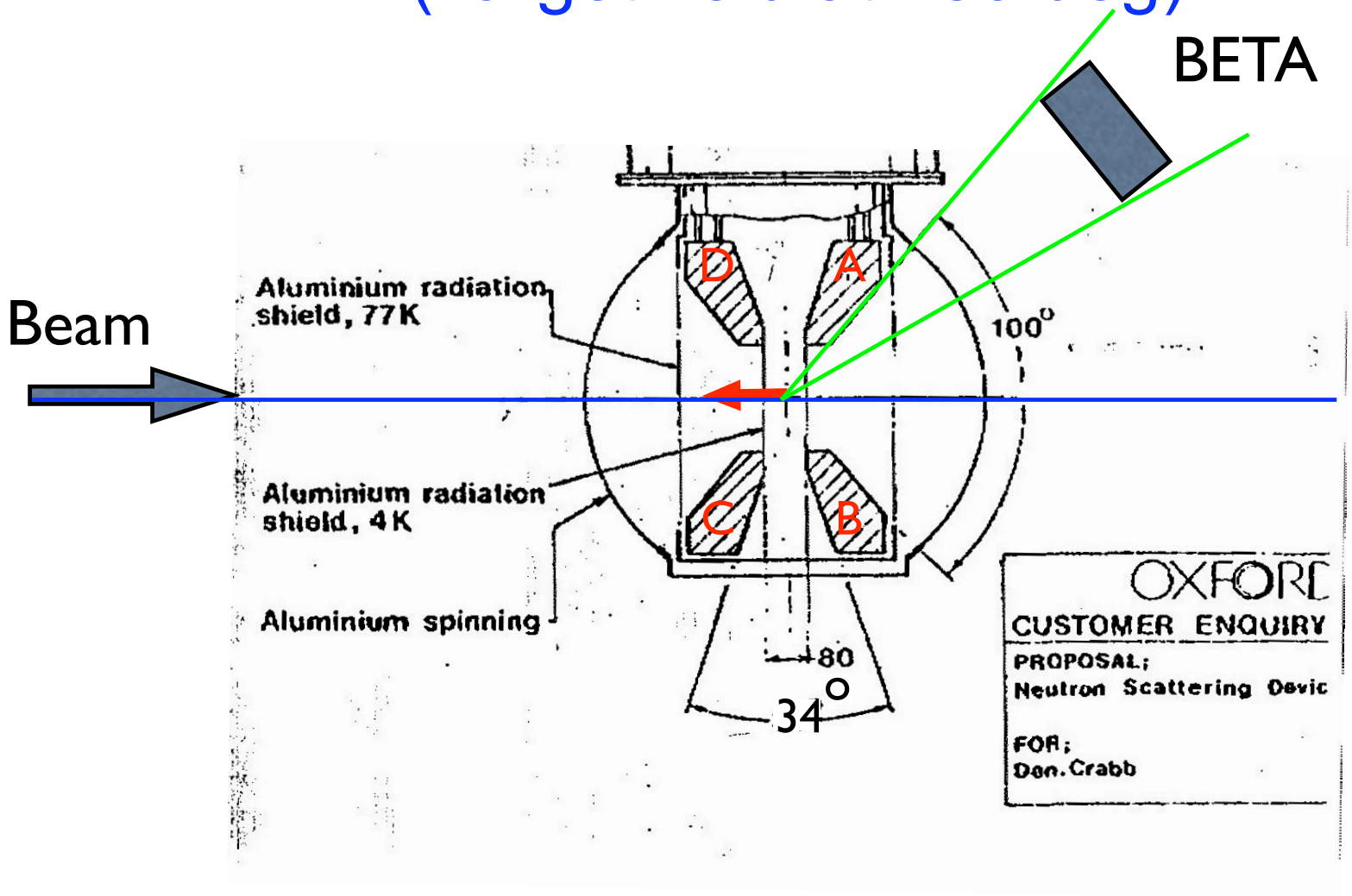
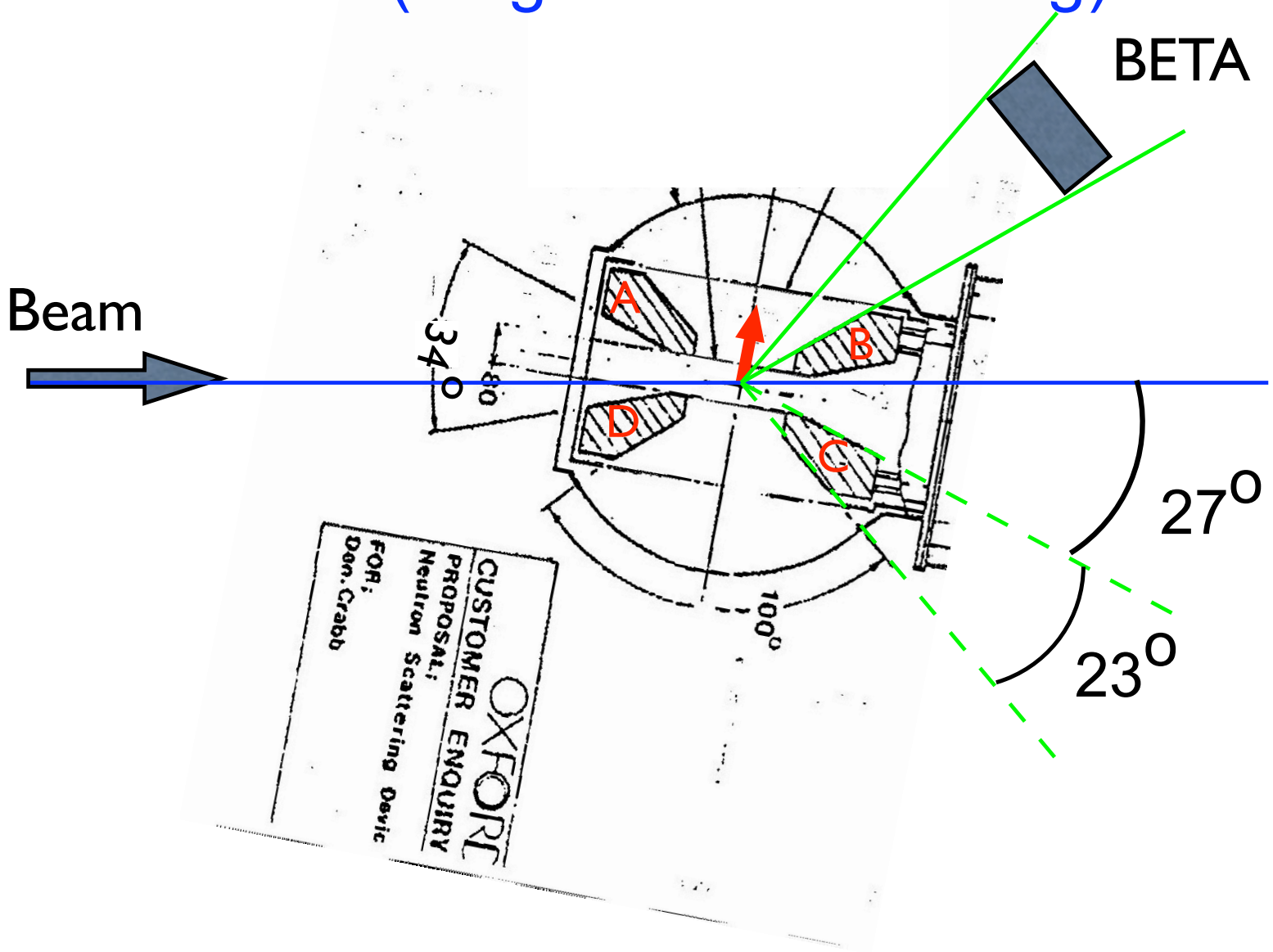
- Design of OVC for SANE, Semi-SANE, and the compton experiment
- Need to determine window locations and dimensions
- Need to decide which can is used

SANE Magnet Configuration
(Target field at 180 deg)



SANE Magnet Configuration
(Target Field at 80 deg)



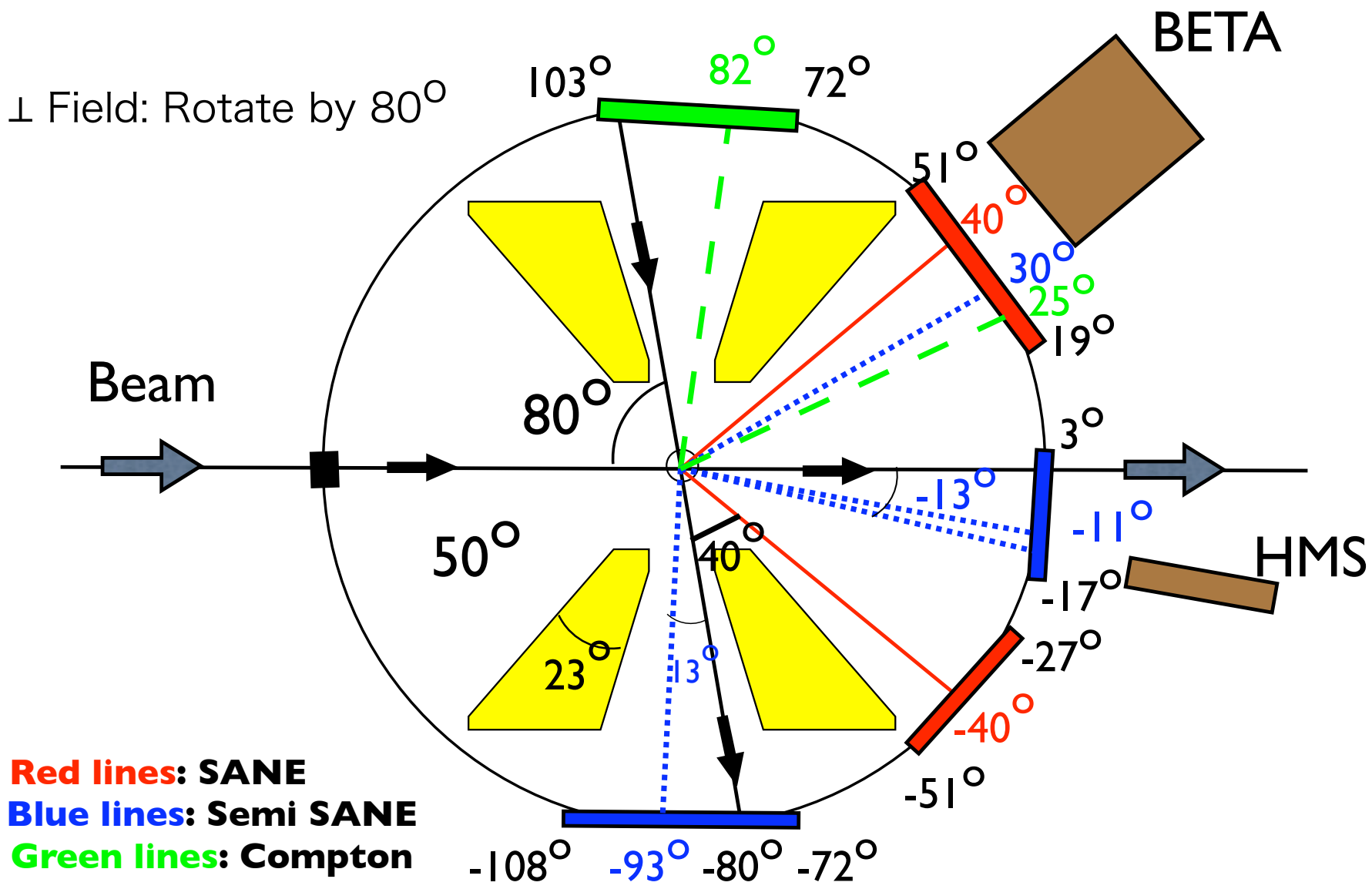
Kinematics for SANE, Semi-SANE, and Compton experiments (Apr. '05)

	Beam Energy (GeV)	BETA energy (GeV)	BETA Angle (deg)	P_{HMS} (GeV/c)	HMS angle (deg)	Target Field	Run type
SANE	4.8, 6.0	0.8-2.2	40	--	--	// ⊥	Production
	6.0	--	--	1.0-1.7	36-44	//	e^+ BG
	2.4	1.3-1.8	40	1.1-1.7	33-48	//, off	Calibration: ep elastic
Semi SANE	6.0	0.75-2.0	30	2.7	10.8	//	Production
	6.0	0.75-1.1	40	4.0	13.1	//	Parasitic
Com pton	4.8	3.0	25	2.0	39	// off	Production Calibration: ep elastic
	4.8	0.9	82	4.3	12	//	Production

Estimating Window Dimensions

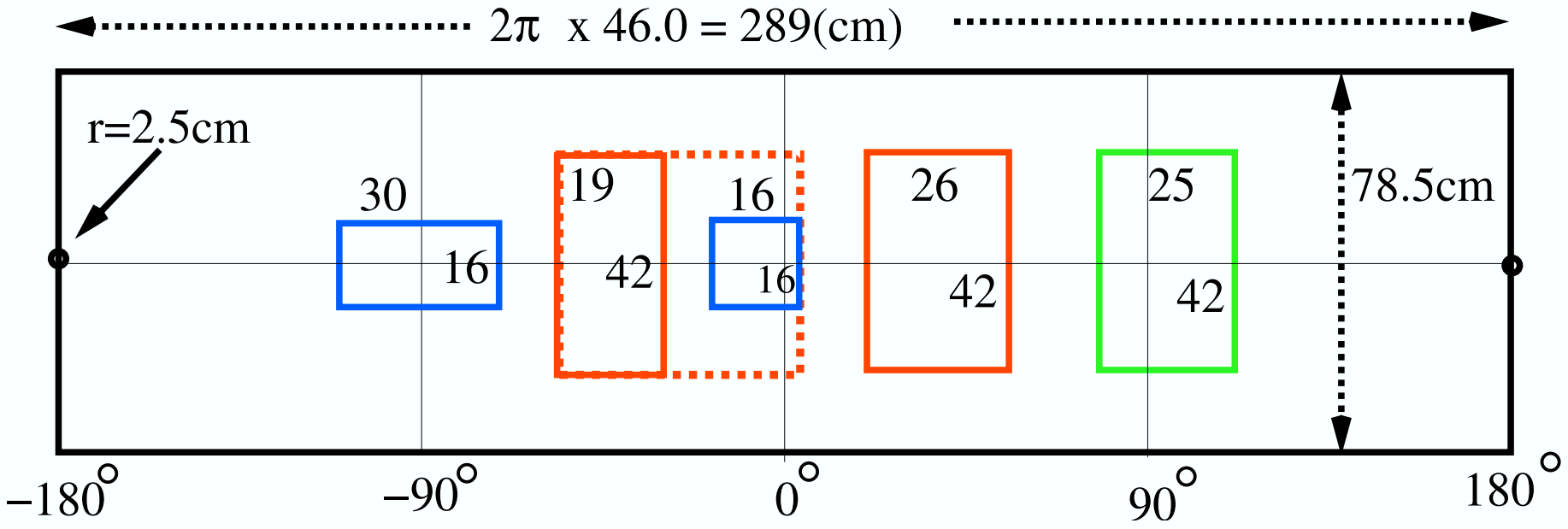
- Ray-trace program was used to calculate the effect of particle deflection due to the target field
- Find the region where the particles intersect the OVC wall when they are detected in BETA (or HMS)
- Detect Electrons (0.7-3.0GeV) in BETA
- HMS momentum range depends on each kinematics (momentum is as low as 1Gev/c)

Target Window Openings (Apr. 2005)



Window locations and dimensions (Apr 2005)

- Window dimensions (in cm) estimated using a ray-trace program
- OVC with the outer radius of 46.0 cm



New / Existing Vacuum Cans

1. Gen can (Too many windows exist)
2. SLAC can (Two large windows exist)
3. Blue can (smaller windows only)
4. New fresh can (would cost ~$40k)

1. Recycling the Gen Can

- Used in Hallc in 2001-2002
- Wall thickness is 1 inch
- Too many windows already exist and they don't match with our window design
- A portion of the existing window must be filled, but that may cause a leak problem.
- Not practical to recycle the Gen can

2. Recycling the SLAC Can

- Used at SLAC (now it's at JLab)
- Outer radius of 46cm, wall thickness 9mm
- Two large windows (12in diameter) and two small windows (4in diameter) exist
- Locations of the existing windows do not match well with our window design
- This can is not the best choice.

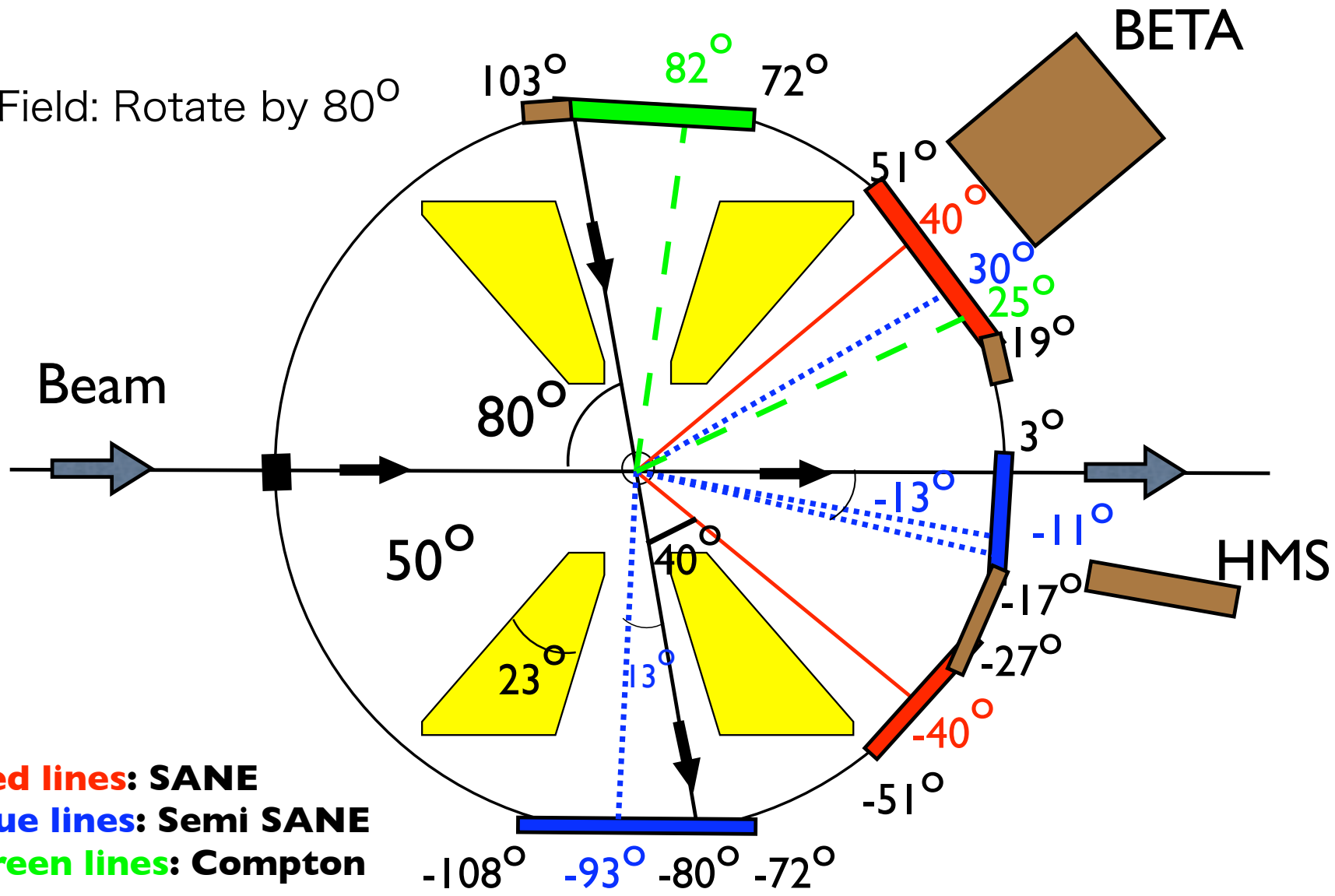
3. Recycling the Blue Can

- Identical dimensions as the SLAC can (Outer radius 46cm, wall thickness 9mm)
- One 'smile' window (10 x 2in) and two small windows of 2in diameter
- This window pattern matches with our projected window design
- The detailed calculation is needed to prove/ disprove that the 9mm wall is thick enough.
- Cost of recycling this can might be comparable to that of a NEW can (according to P. Brindza)

4. Making A New Fresh Can

- Wall thickness would be made as thick as possible
- It would cost ~$40k according to P. Brindza
- Windows can be made even larger;
  this can could still be used when kinematics is changed after the can is fabricated.
- Need to check if Hallc has enough money.

Target Window Openings (Apr. 2005)



Summary

- Window dimensions and locations are recalculated and updated.
- This window design is not final yet.
- Need to decide either to make a new can or try to recycle the blue can.