Update on Target Vacuum Can

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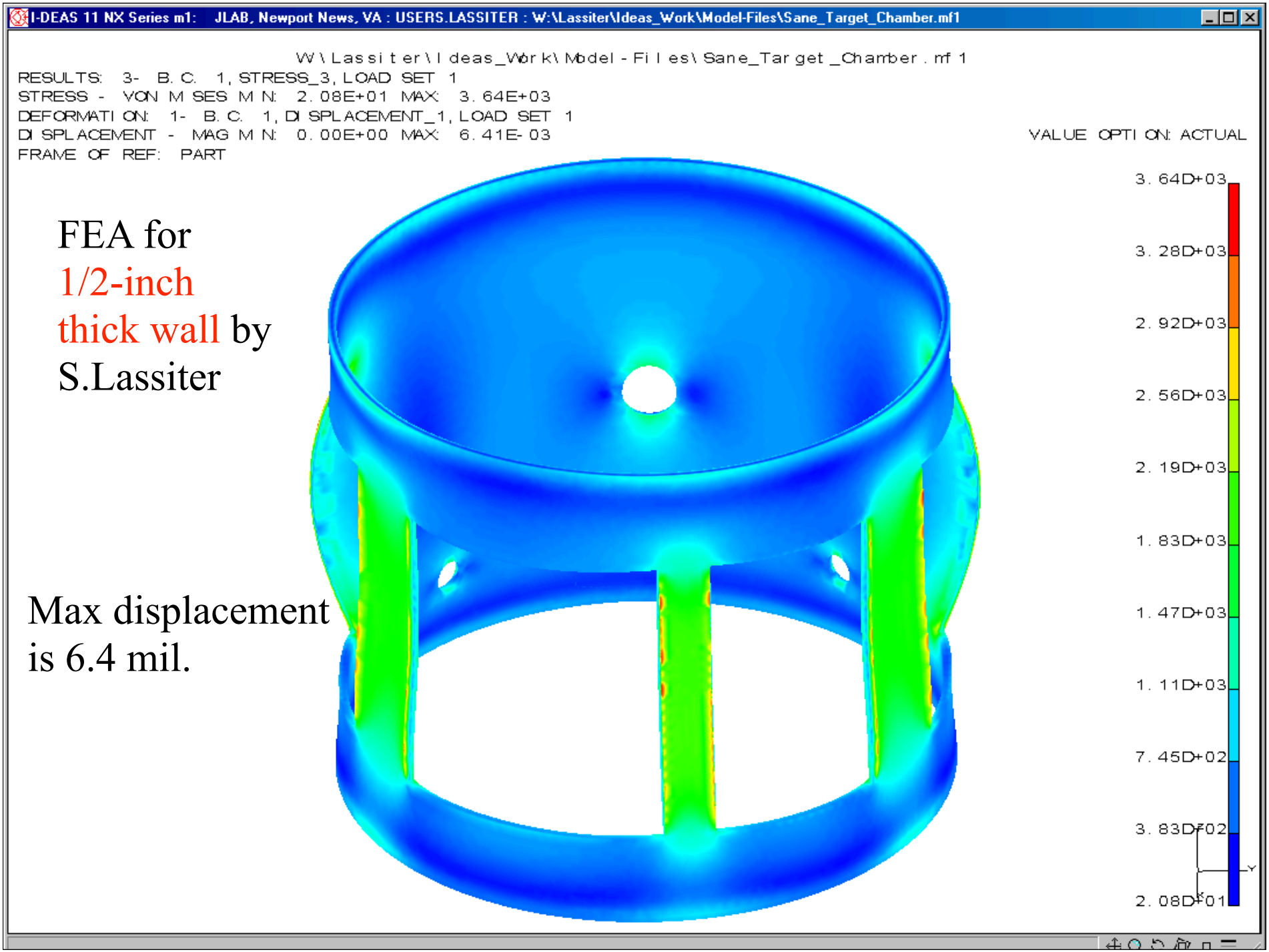
- OVC Design for SANE, Semi-SANE, and Real Compton experiment

Current Status on the OVC

- P. Brindza and others are doing the engineering design work (FEA, wall thickness, etc).
- Design of nitrogen shield is in progress.
- The fabrication of the target chamber need to be finished by the end of this fiscal year.

Finite Element Analysis (FEA)

- S. Lassiter did a SANE target chamber finite element analysis for three thickness (1 in, 1/2 in, and 1/4 in).
- All three of them would work because the displacement is small (< 17 mil).
- A thicker wall (1/2 in or 1in) would be preferred because the windows are probably bolted into the OVC.

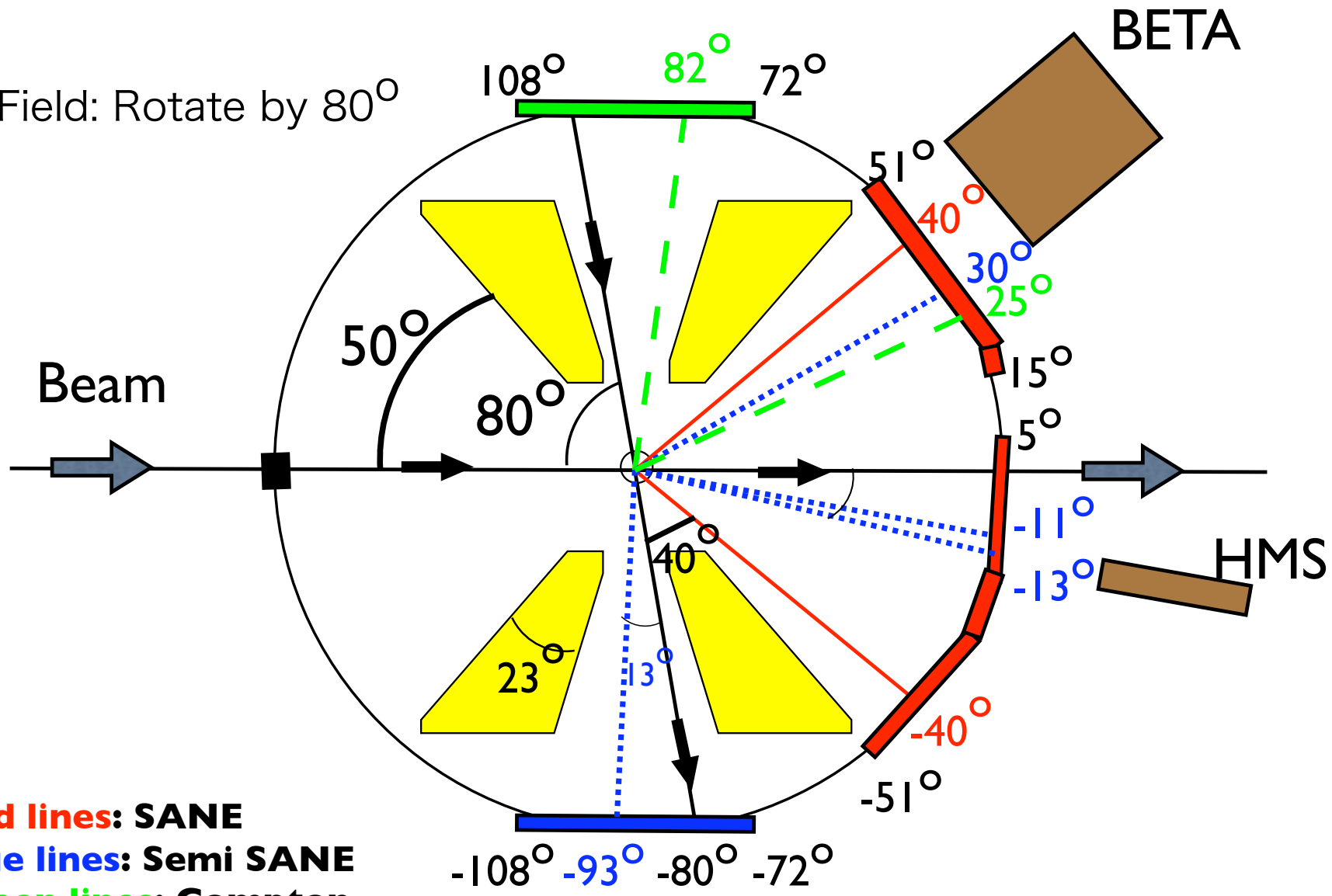

I-DEAS 11 NX Series m1: JLAB, Newport News, VA : USERS.LASSITER : W:\Lassiter\Ideas_Work\Model-Files\Sane_Target_Chamber.mf1
W:\Lassiter\Ideas_Work\Model-Files\Sane_Target_Chamber.mf1
RESULTS: 3- B.C. 1, STRESS_3, LOAD SET 1
STRESS - VON MISES MIN: 2.08E+01 MAX: 3.64E+03
DEFORMATION: 1- B.C. 1, DISPLACEMENT_1, LOAD SET 1
DISPLACEMENT - MAG MIN: 0.00E+00 MAX: 6.41E-03
FRAME OF REF: PART
VALUE OPTION: ACTUAL
3.64D+03
3.28D+03
2.92D+03
2.56D+03
2.19D+03
1.83D+03
1.47D+03
1.11D+03
7.45D+02
3.83D+02
2.08D+01
FEA for
1/2-inch
thick wall by
S.Lassiter
Max displacement
is 6.4 mil.

Design of Liquid Nitrogen Shield

- The LN Shield with a diameter of 83.0cm sits inside of OVC. LN window dimensions are similar to OVC windows.
- Al foil or super-insulation is held off on an Al frame away from the LN Shield to avoid pressure differential across it.
- The frame will be supported by stand-offs of 3mm hight to cool the frame and the foil. Air is pumped through the gaps.

OVC Windows (Submitted in Aug, 2005)

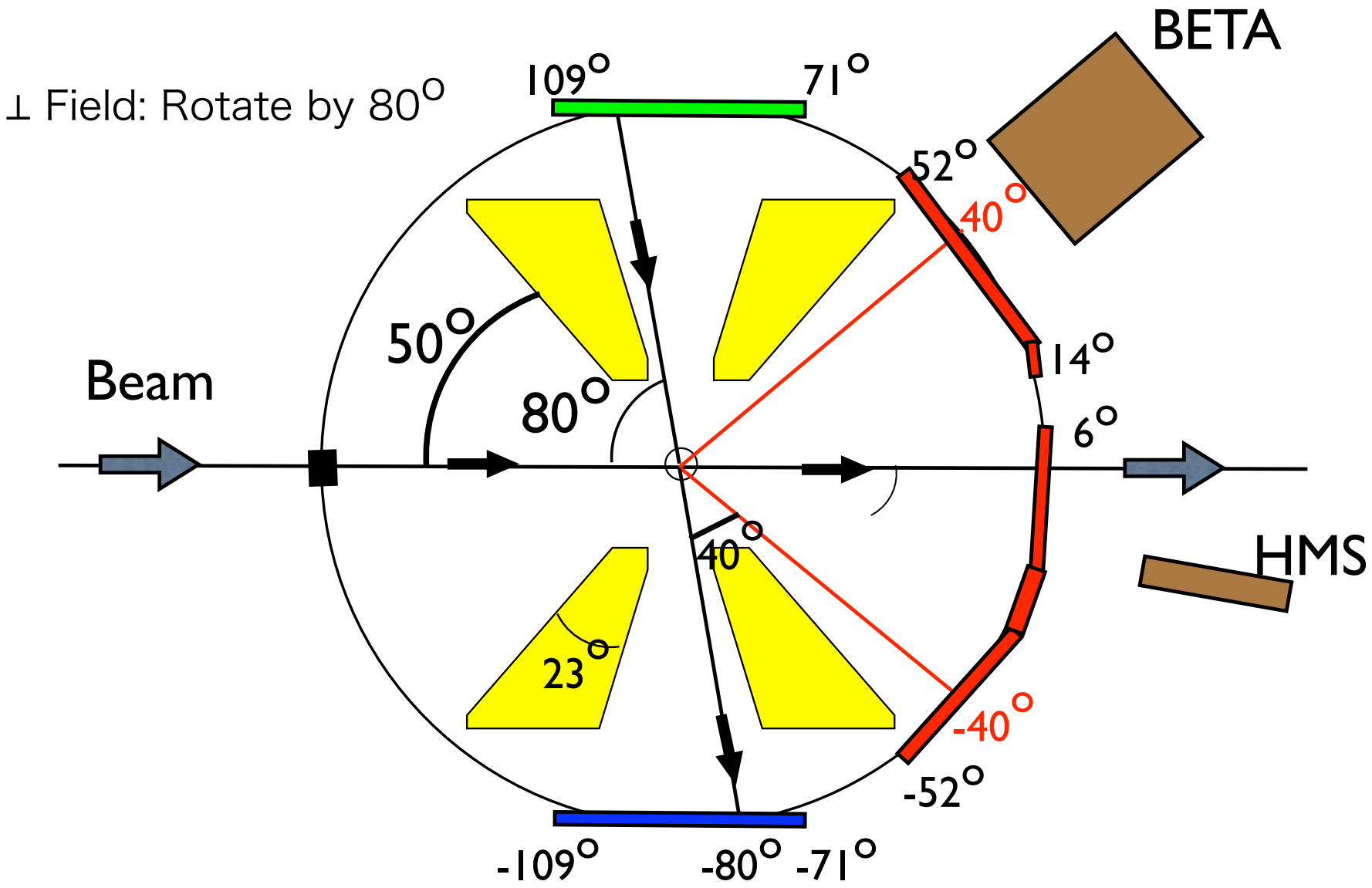
R=46cm



Red lines: SANE
Blue lines: Semi SANE
Green lines: Compton

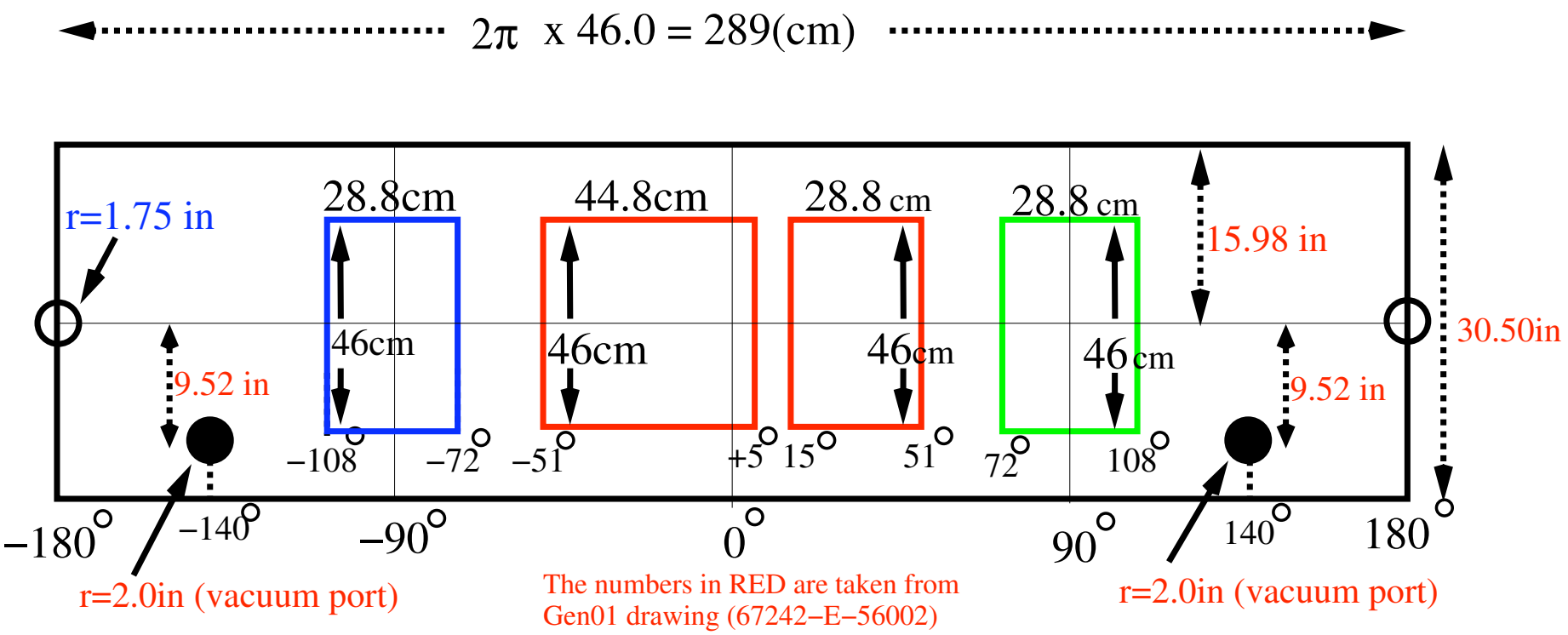
Nitrogen Shield Windows (Dec 2005)

R=41.5cm



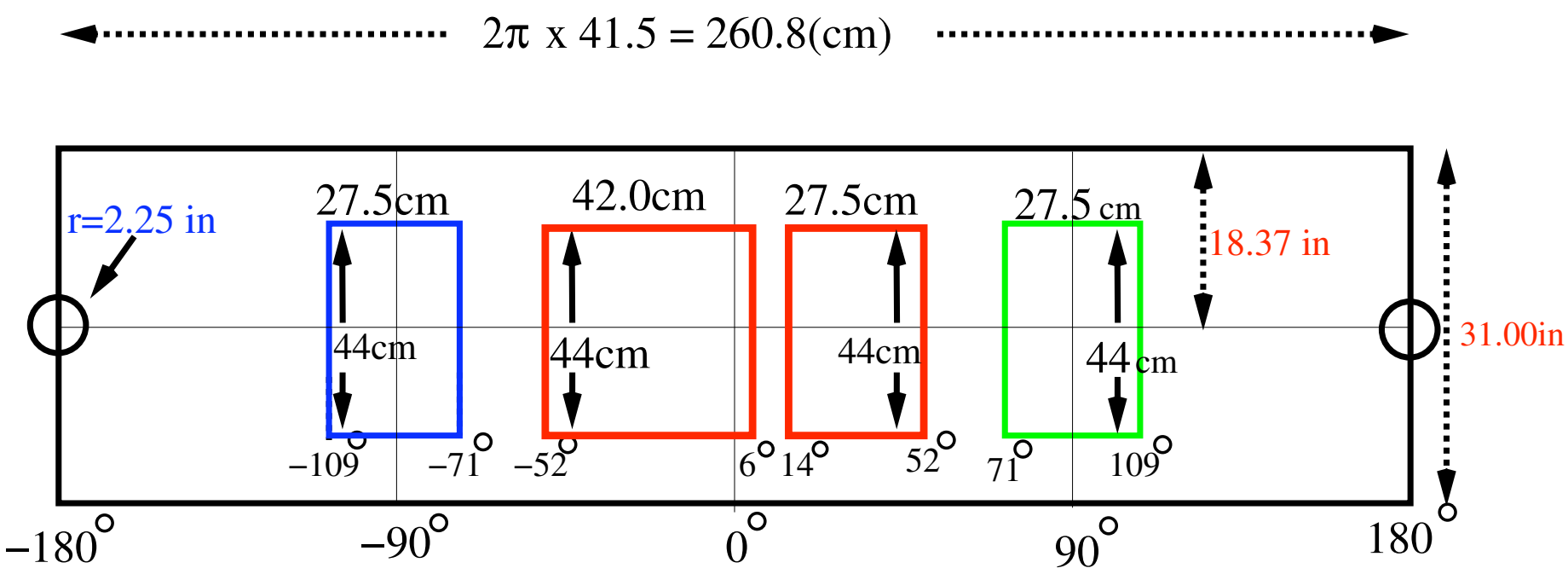
OVC Window locations and dimensions (Submitted in Aug, 2005)

- Roll-out view of the OVC with the inner radius of 46.0 cm



Nitrogen Shield Window locations and dimensions (Dec, 2005)

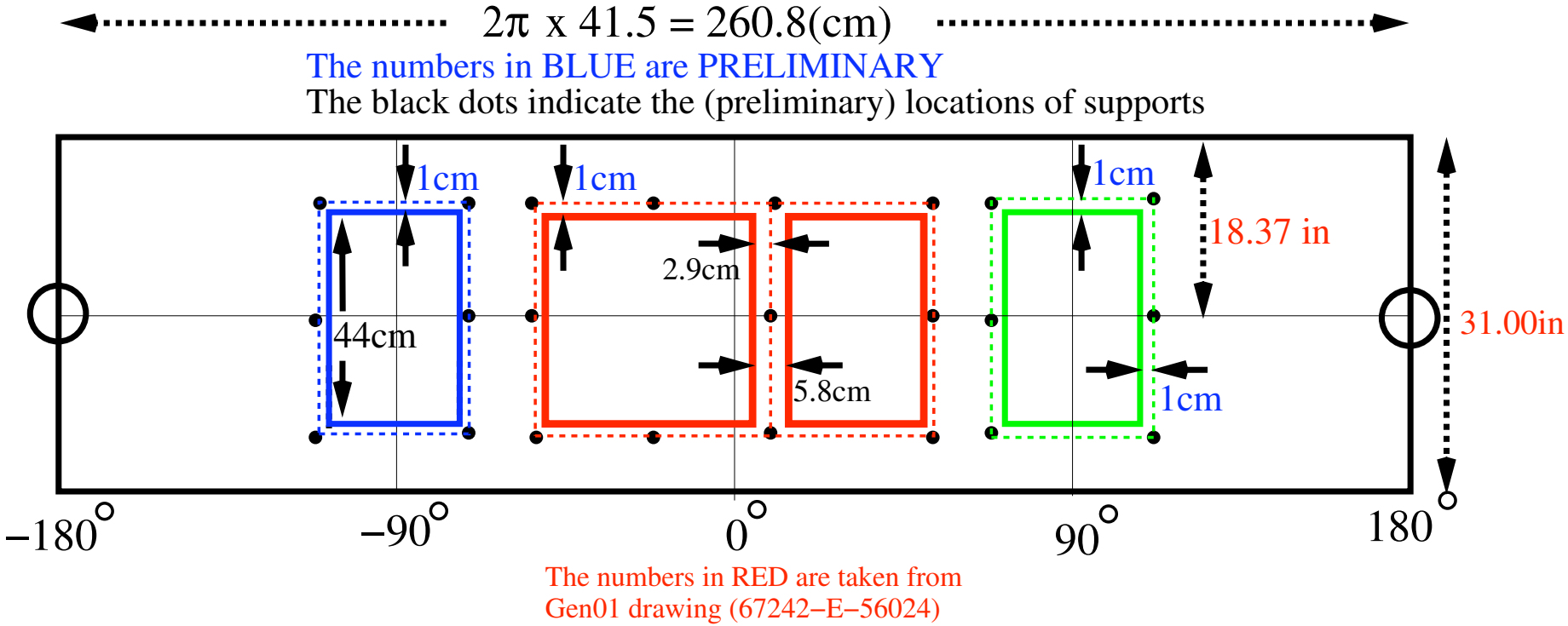
- Roll-out view of the Nitrogen Shield can with the inner radius of 41.5 cm



The numbers in RED are taken from Gen01 drawing (67242−E−56024)

Nitrogen Shield: Frame locations and dimensions (Preliminary)

- A frame (dashed line) for Al foil or super insulation is mounted at each large window on LN2 can. It will be located at 3mm outside of the LN2 can. (Solid lines are LN2 windows)



Other things to do

- Window thickness for our OVC;
  Engineering drawings (P. Brindza and others)
- Finalize nitrogen shield design (Tajima)
- The Be window of 3” 5/16 diameter will be taken out from the old OVC for Gen01 and be put on the new can.

Timeline

- Engineering calculations and drawings (~2months ??) (P. Brindza and others)
- Design of Nitrogen Shield(~1month)(Tajima)
- Manufacturing of OVC (~6months including bidding period)
- Testing the OVC (Summer/Fall 2006 ?) (M.Seely)