

Beam shielding design in A3

R. Prigl, 12-15-00

Design is based on the following assumptions:

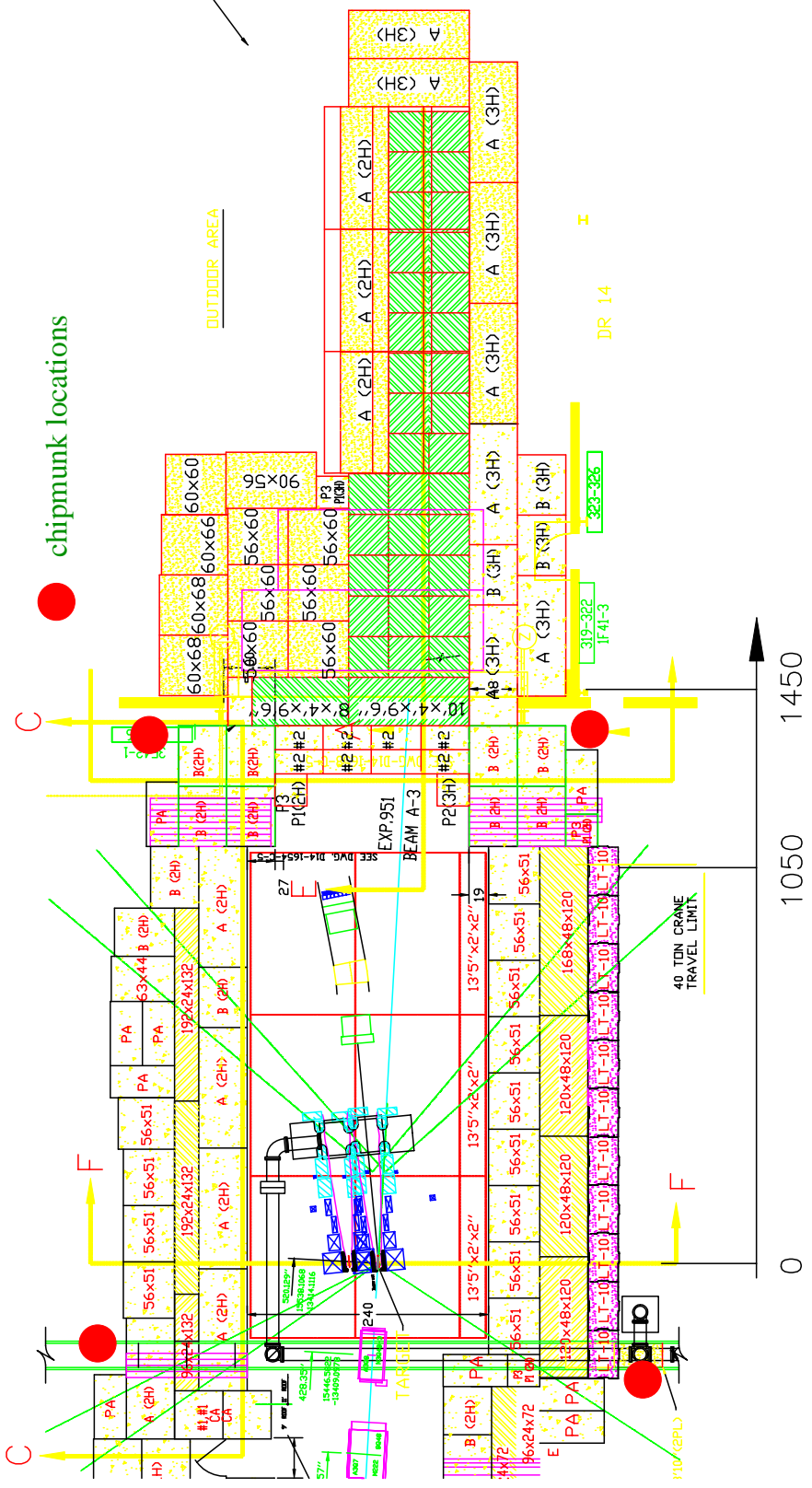
- up to 10^{16} p per hour at 24 GeV/c into the beam dump, continuous tuning at a few TP w/o target
 - “o.k.” (higher momentum would require longer stop)

- up to 10^{15} p per hour on a thick target at the E951 target location, single pulses at highest energy available;
 - chipmunk response to fast beam
 - transition from cave to beamstop

- dose limit inside Building 912 is 100mrem/hr (radiation area) for accessible, low occupation areas

- dose limit outside Bldg. 912 is 5mrem/hr for controlled area, 0.05mrem/hr for uncontrolled area, see page 15 of <http://www.agsrhichome.bnl.gov/AGS/Accel/SND/OPM/Ch09/09-01-11.PDF> for area classifications

chipmunk locations



0 1050 1450

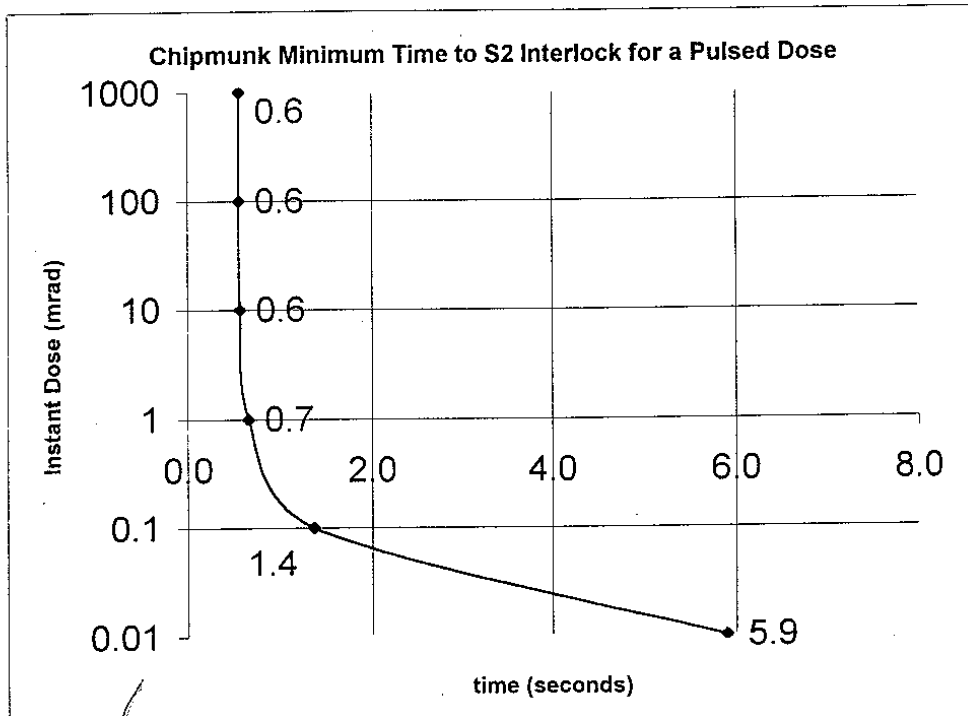
Response of a Chipmunk to Instantaneous Irradiation
 (Full Dose in less than 5 ms)

Dose x Chamber x ~Chamber = Charge => ~Voltage => ~I/F => Minimum
 mrad Response Efficiency Coulombs .02 mF Hz/2 QF 2.5 Time to
 @ 100% Trip
 seconds

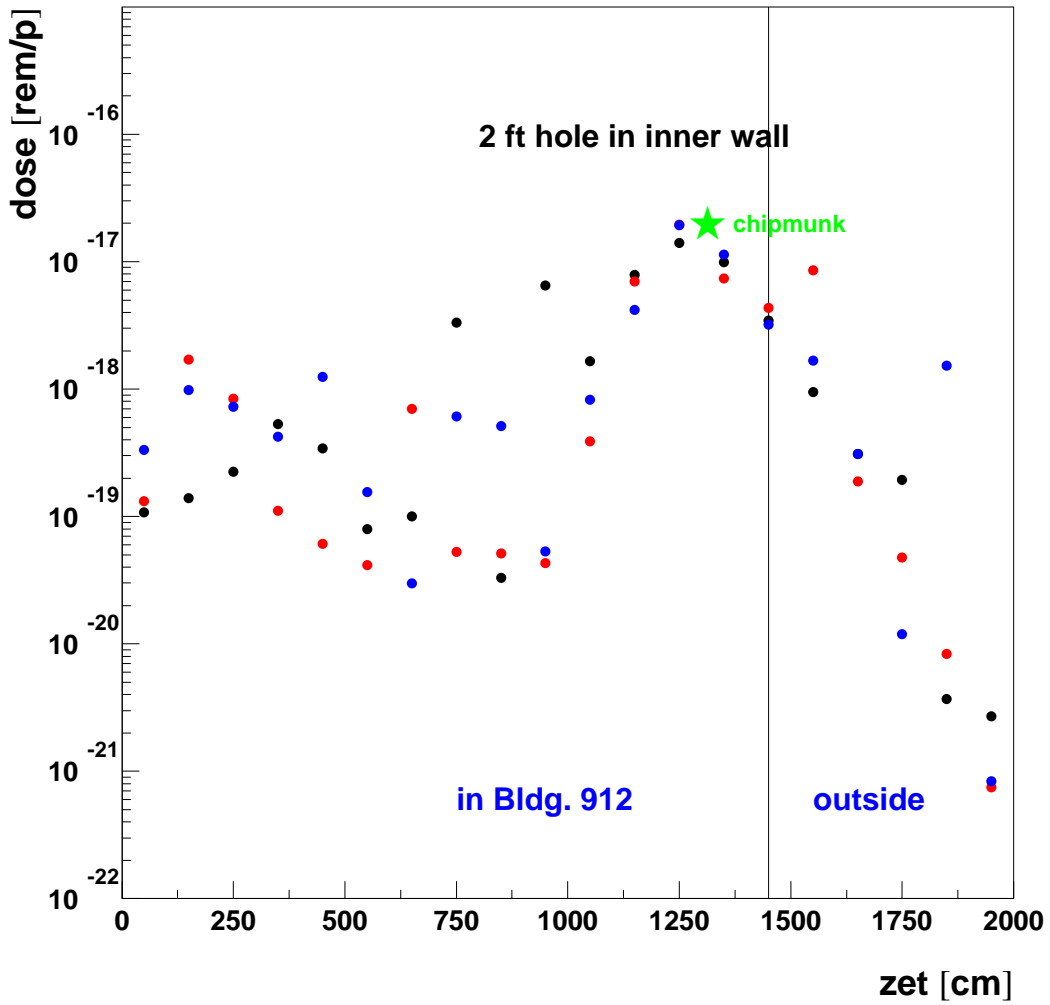
0.01	2.30E-09	1.00	2.30E-11	1.15E-03	4.70E-01	5.9
0.1	2.30E-09	1.00	2.30E-10	1.15E-02	4.88E+00	1.4
1	2.30E-09	0.97	2.23E-09	1.12E-01	5.00E+01	0.7
10	2.30E-09	0.76	1.75E-08	8.74E-01	3.92E+02	0.6
100	2.30E-09	0.30	6.90E-08	3.45E+00	1.55E+03	0.6
1000	2.30E-09	0.06	1.38E-07	6.90E+00 *	2.50E+03	0.6

Response is the time from instantaneous dose to "S2" interlock.

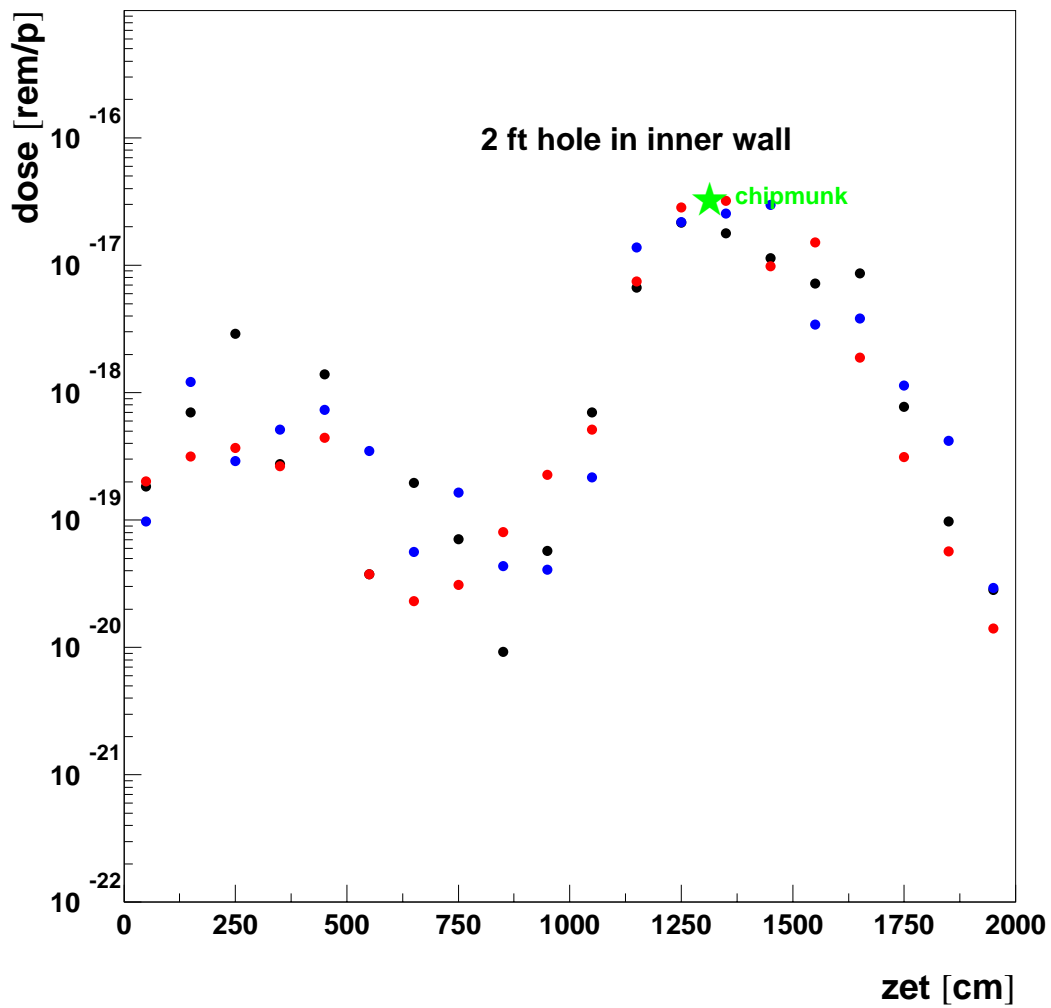
* saturation, 2500 is max frequency @ QF = 2.5



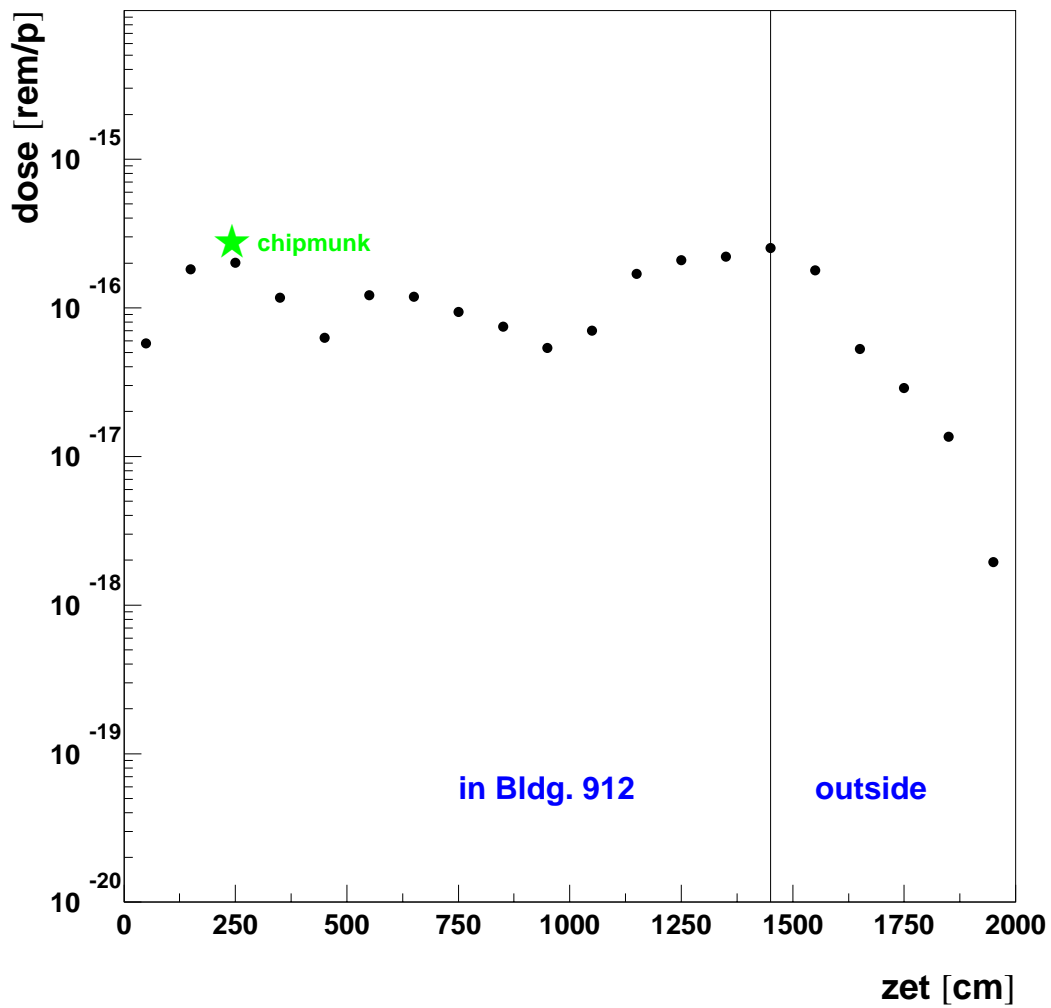
dose along west wall (x=690cm)



dose along east wall (x=-530cm)



dose on roof, y=360 cm and x=0 cm



dose on roof, y=360 cm and x=400 cm

