

Thu 07-JAN-2021 14:49:20

1.E+17

7.E+16

5.E+16

2.E+16

0

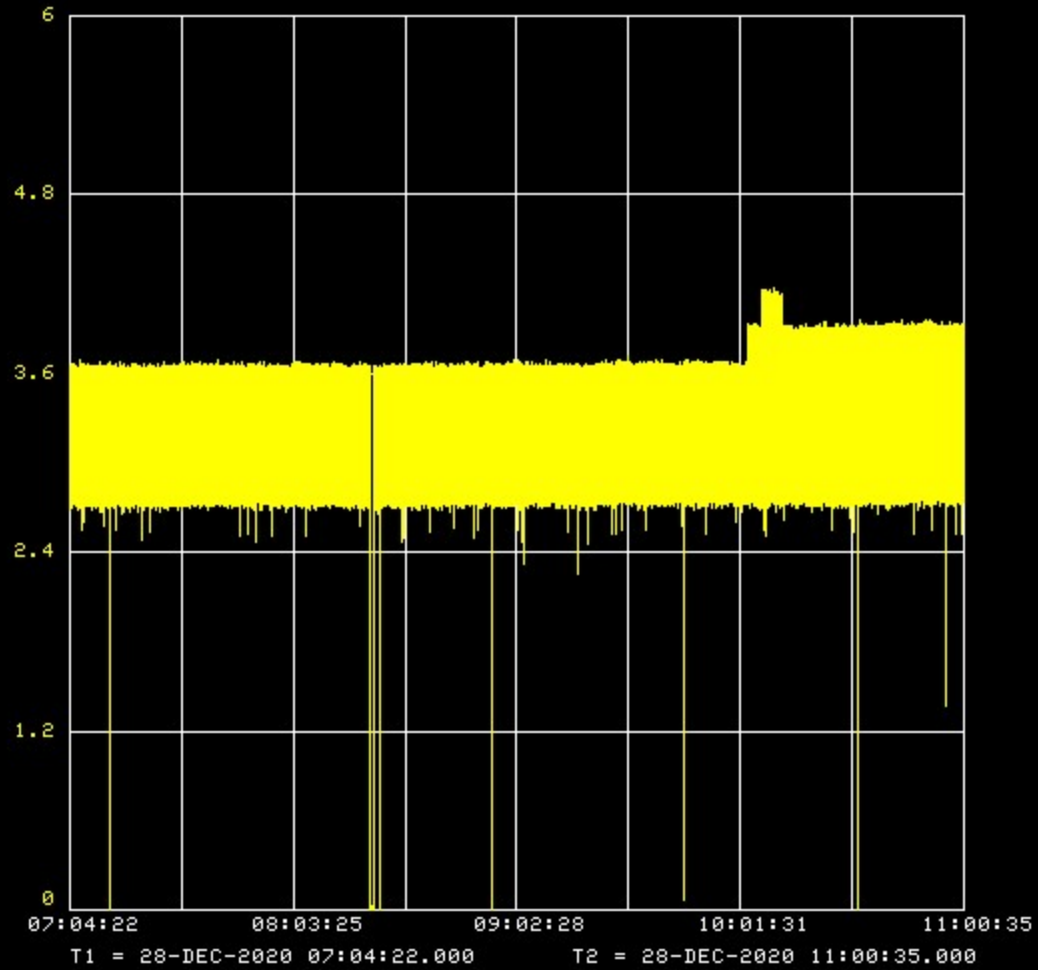
12:00:30 12:45:35 13:30:41 14:15:47 15:00:53

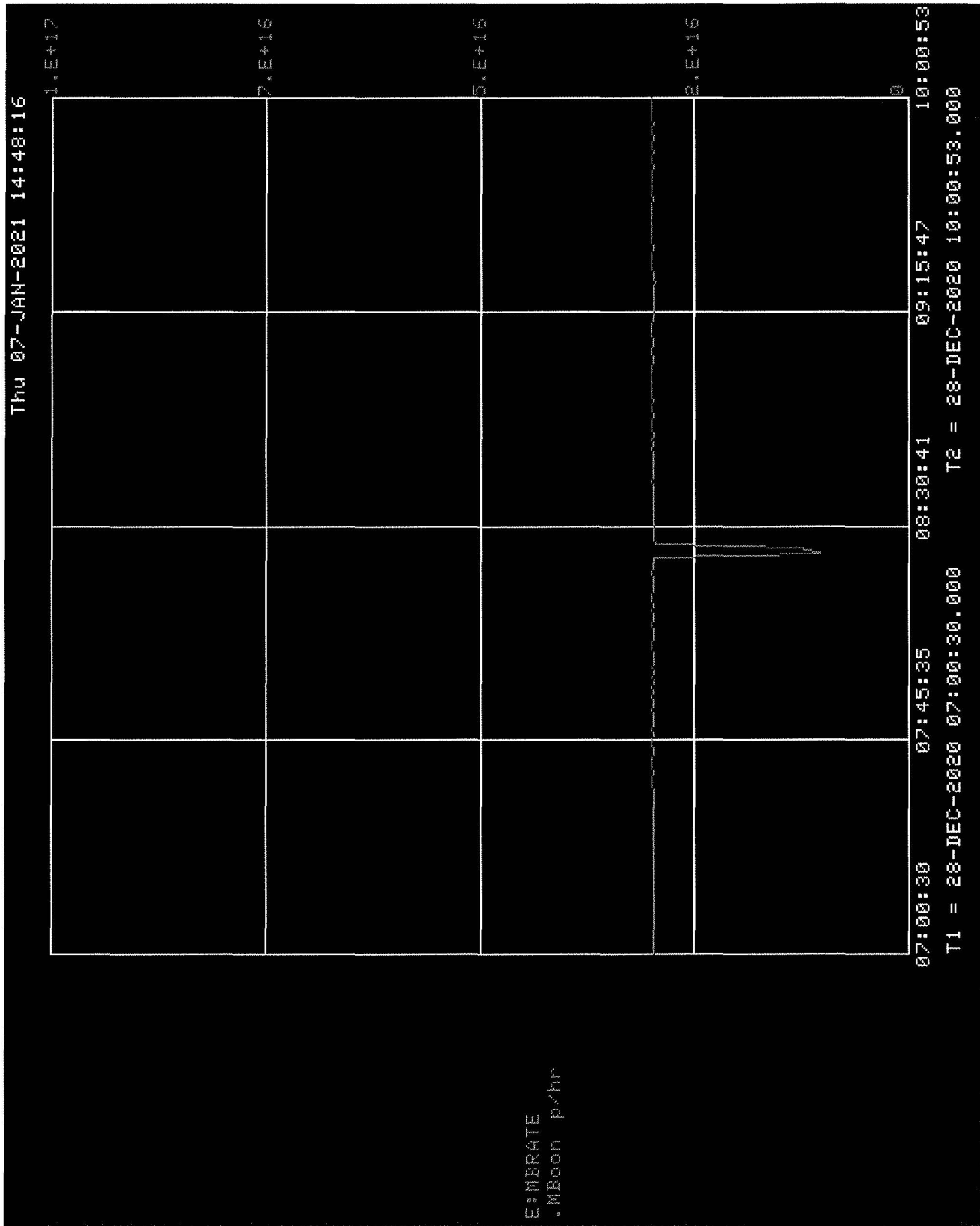
T1 = 17-NOV-2020 12:00:30.000 T2 = 17-NOV-2020 15:00:53.000

E:MBRATE
.MBoon p/hr

Fri 12-FEB-2021 11:57:02

B:BBM800
.Backup E12





8 GeV Line

Gamma Survey Results

Bicron Results

Location	Background (cpm)	Gross Beam-On (cpm)	Net Beam-On (cpm)	Standard Deviation	Net ± St. Dev.	L _c	N _D
1	1180	1110	-70	47.85	-70 ± 47.85	79.901	162.542
2	1436	1083	-353	50.19	-353 ± 50.19	88.143	179.030
3	1284	1120	-164	49.03	-164 ± 49.03	83.347	169.437
4	1251	1147	-104	48.97	-104 ± 48.97	82.269	167.280
5	1311	1166	-145	49.77	-145 ± 49.77	84.219	171.181
6	1333	1231	-102	50.64	-102 ± 50.64	84.923	172.588
7	1290	1275	-15	50.65	-15 ± 50.65	83.542	169.826
8	1325	1810	485	55.99	485 ± 55.99	84.668 !	172.078
9	911	1433	522	48.41	522 ± 48.41	70.205 !	143.146
10	967	1192	225	46.47	225 ± 46.47	72.331 !	147.399
11	1199	1189	-10	48.87	-10 ± 48.87	80.541	163.823
12	1298	1129	-169	49.26	-169 ± 49.26	83.801	170.343
13	1030	1201	171	47.23	171 ± 47.23	74.650 !	152.038
14	1340	1266	-74	51.05	-74 ± 51.05	85.146	173.034
15	1303	1279	-24	50.81	-24 ± 50.81	83.962	170.666
16	1039	3054	2015	63.98	2015 ± 63.98	74.975 !	152.689

Converted to mR/hr

Background (mR/hr)	Gross Beam-On (mR/hr)	Net Beam-On (mR/hr)	Standard Deviation	Net ± St. Dev.	D _D
0.006	0.006	0.000	0.0002	0 ± 0.0002	0.001
0.007	0.005	0.000	0.0003	0 ± 0.0003	0.001
0.006	0.006	0.000	0.0002	0 ± 0.0002	0.001
0.006	0.006	0.000	0.0002	0 ± 0.0002	0.001
0.007	0.006	0.000	0.0002	0 ± 0.0002	0.001
0.007	0.006	0.000	0.0003	0 ± 0.0003	0.001
0.006	0.006	0.000	0.0003	0 ± 0.0003	0.001
0.007	0.009	0.002	0.0003	0.002 ± 0.0003	0.001
0.005	0.007	0.003	0.0002	0.003 ± 0.0002	0.001
0.005	0.006	0.001	0.0002	0.001 ± 0.0002	0.001
0.006	0.006	0.000	0.0002	0 ± 0.0002	0.001
0.006	0.006	0.000	0.0002	0 ± 0.0002	0.001
0.005	0.006	0.001	0.0002	0.001 ± 0.0002	0.001
0.007	0.006	0.000	0.0003	0 ± 0.0003	0.001
0.007	0.006	0.000	0.0003	0 ± 0.0003	0.001
0.005	0.015	0.010	0.0003	0.01 ± 0.0003	0.001

8 GeV Line

Neutron Survey Results

Location	Average Background (mrem)	Average Background (mrem/hr)	Gross Beam-On (mrem/hr)	Net Beam-On (mrem/hr)	Sample Standard Deviation (mrem/hr)	Net \pm St. Dev. (mrem/hr)	L _{C,N}	D _{D,N}
1	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
2	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
3	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
4	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
5	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
6	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
7	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
8	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
9	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
10	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
11	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
12	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
13	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
14	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
15	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04
16	0.01933	0.01933	0.000	0.000	1.08E-04	0 \pm 0.000108	2.52E-04	5.04E-04

8 GeV Line - 8 GeV Locations

Scaling Dose Rates to 8 GeV Operating Limit Intensity & Calculate Annual Dose

At Survey Intensity

Scaled to Operating Limit Intensity at Standard Beam Up-Time

Location	At Survey Intensity		Scaled to Operating Limit Intensity at Standard Beam Up-Time					
	Gamma Net Beam- On (mR/hr)	Neutron Net Beam- On (mrem/hr)	Gamma			Neutron		
			Net Beam- On (mR/hr)	2,000 hr Working Year (mrem)	24/7/365 (mrem)	Net Beam- On (mrem/hr)	2,000 hr Working Year (mrem)	24/7/365 (mrem)
1	0.000	0.000	0.000	0.000	0.000	0	0	0
2	0.000	0.000	0.000	0.000	0.000	0	0	0
3	0.000	0.000	0.000	0.000	0.000	0	0	0
4	0.000	0.000	0.000	0.000	0.000	0	0	0
5	0.000	0.000	0.000	0.000	0.000	0	0	0
6	0.000	0.000	0.000	0.000	0.000	0	0	0
7	0.000	0.000	0.000	0.000	0.000	0	0	0
8	0.002	0.000	0.003	6.311	27.643	0	0	0
9	0.003	0.000	0.005	9.467	41.464	0	0	0
10	0.001	0.000	0.002	3.156	13.821	0	0	0
11	0.000	0.000	0.000	0.000	0.000	0	0	0
12	0.000	0.000	0.000	0.000	0.000	0	0	0
13	0.001	0.000	0.002	3.156	13.821	0	0	0

Intensities (protons/hr)		Beam Up-Time	
Survey	Op. Limit	# Weeks	Efficiency
1.80E+17	2.84E+17	52	100%
		100.0%	

8 GeV Line - Booster Neutrino Beam (BNB Locations)

Scaling Dose Rates to BNB Operating Limit Intensity & Calculate Annual Dose

At Survey Intensity

Scaled to Operating Limit Intensity at Standard Beam Up-Time

Location	At Survey Intensity		Scaled to Operating Limit Intensity at Standard Beam Up-Time					
	Gamma Net Beam- On (mR/hr)	Neutron Net Beam- On (mrem/hr)	Gamma			Neutron		
			Net Beam- On (mR/hr)	2,000 hr Working Year (mrem)	24/7/365 (mrem)	Net Beam- On (mrem/hr)	2,000 hr Working Year (mrem)	24/7/365 (mrem)
13	0.001	0.000	0.005	10.983	48.106	0	0	0
14	0.000	0.000	0.000	0.000	0.000	0	0	0
15	0.000	0.000	0.000	0.000	0.000	0	0	0
16	0.010	0.000	0.055	109.831	481.058	0	0	0

Intensities (protons/hr)

Survey Op. Limit

2.95E+16 1.62E+17

Beam Up-Time

Weeks 52
Efficiency 100%

100.0%