Six tables for case 2 with 3.2 mr

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This is an addendum to references [1] and [2]. Those notes dealt with the geometries of case 1, 2.6 mr case, and case 3, 3.8 mr case.

This additional note deals with case 2, the 3.2 mr case. The acceptance is ± 3.2 mr vertically and ± 42 mr horizontally. There are 6 tables, in 3 groups of 2. The numbers represent intensities outside the indicated regions at 14 m from the target, for 10^{14} protons per pulse. The first group gives the number of neutrons, calculated starting with 50 million in a large phase space. This number is then normalized to obtain the absolute number per pulse, for the second group. The third group gives the fraction of the total number of neutrons. The first table of a group is the result of a calculation for neutrons starting with a momentum above 750 MeV/c, and allowing a final energy down to 10 MeV. The second table is for a calculation starting with momenta lower than 750 MeV/c, but above 10 MeV in energy. The normalization of the low and high energy results to absolute numbers is explained in reference [1].

References

[1] The neutron halos for 2 different x-y aspect ratios, for the initial energy between 10 MeV and 260 MeV, and for the initial energy above 260 MeV http://www.triumf.ca/people/doornbos/halocomplow.ps

[2] Twelve tables for case 1 with 2.6 mr and case 3 with 3.8 mr vertical acceptance http://www.triumf.ca/people/doornbos/halo12tables.ps

Table 1: Number of calculated neutrons outside the indicated areas. For instance, y 8 cm and x 90 cm means the central area of 16 by 180 cm. This is for the high energy calculation of case 2.

	x(cm)	x(cm)	x(cm)	x(cm)	x(cm)
y(cm)	80	90	100	110	120
8	2065	1895	1814	1794	1765
9	1334	1157	1069	1046	1015
10	915	731	636	610	575
11	682	490	393	366	329
12	569	376	278	248	210
13	510	317	214	184	145
14	498	305	202	172	131
15	487	292	189	159	118
16	474	279	176	146	105
17	463	268	163	133	92

Table 2: Number of calculated neutrons outside the indicated areas. For instance, y 8 cm and x 90 cm means the central area of 16 by 180 cm. This is for the low energy calculation of case 2.

	x(cm)	x(cm)	x(cm)	x(cm)	x(cm)
y(cm)	80	90	100	110	120
8	899	680	562	544	539
9	652	424	298	280	273
10	543	310	180	160	153
11	493	257	125	103	94
12	460	223	90	68	59
13	443	205	71	49	40
14	433	194	59	36	27
15	426	185	50	27	18
16	424	183	48	25	16
17	422	181	46	23	14

Table 3: Absolute number of neutrons per pulse in units of K outside the indicated areas. For instance, y 8 cm and x 90 cm means the central area of 16 by 180 cm. This is for the high energy calculation of case 2

	x(cm)	x(cm)	x(cm)	x(cm)	x(cm)
y(cm)	80	90	100	110	120
8	7640	7011	6712	6638	6530
9	4936	4281	3955	3870	3755
10	3385	2705	2353	2257	2127
11	2523	1813	1454	1354	1217
12	2105	1391	1029	918	777
13	1887	1173	792	681	536
14	1843	1128	747	636	485
15	1802	1080	699	588	437
16	1754	1032	651	540	388
17	1713	992	603	492	340

Table 4: Absolute number of neutrons per pulse in units of K outside the indicated areas. For instance, y 8 cm and x 90 cm means the central area of 16 by 180 cm. This is for the low energy calculation of case 2

	x(cm)	x(cm)	x(cm)	x(cm)	x(cm)
y(cm)	80	90	100	110	120
8	6742	5100	4215	4080	4042
9	4890	3180	2235	2100	2047
10	4072	2325	1350	1200	1147
11	3697	1927	937	772	705
12	3450	1672	675	510	442
13	3322	1537	532	367	300
14	3247	1455	442	270	202
15	3195	1387	375	202	135
16	3180	1372	360	187	120
17	3165	1357	345	172	105

Table 5: Fraction of total neutrons in units of 10^{-6} outside the indicated areas. For instance, y 6cm and x 90 cm means the central area of 16 by 180 cm. This is for the high energy calculation of case 2.

	x(cm	x(cm)	x(cm)	x(cm)	x(cm)
y(cm)	80	90	100	110	120
8	533	489	468	463	456
9	344	299	276	270	262
10	236	189	164	157	148
11	176	126	101	94	85
12	147	97	72	64	54
13	132	82	55	47	37
14	129	79	52	44	34
15	126	75	49	41	30
16	122	72	45	38	27
17	120	69	42	34	24

Table 6: Fraction of total neutrons in units of 10^{-6} outside the indicated areas. For instance, y 6cm and x 90 cm means the central area of 16 by 180 cm. This is for the low energy calculation of case 2.

	x(cm	x(cm)	x(cm)	x(cm)	x(cm)
y(cm)	80	90	100	110	120
8	316	239	197	191	189
9	229	149	105	98	96
10	191	109	63	56	54
11	173	90	44	36	33
12	162	78	32	24	21
13	156	72	25	17	14
14	152	68	21	13	9
15	150	65	18	9	6
16	149	64	17	9	6
17	148	64	16	8	5