HFOFO Project Updates

Week of September 27 – October 3, 2025

https://github.com/criggall/muon-cooling/tree/main

On the field map implementation in G4beamline

	z	n=1	n=2	n=3	n=4	n=5	n=6
0	0	0.120012	0.000017	0.000654	0.000001	0.001120	0.000001
1	20	0.119169	0.000258	0.000666	0.000012	0.001116	0.000008
2	40	0.116730	0.000539	0.000661	0.000006	0.001103	0.000001
3	60	0.112201	0.001093	0.000637	0.000075	0.001092	0.000042
4	80	0.105709	0.001044	0.000628	0.000034	0.001050	0.000022
...	...	...	...	...	...	...	...
205	4100	0.097881	0.001318	0.000564	0.000061	0.000939	0.000031
206	4120	0.105769	0.001045	0.000628	0.000045	0.001048	0.000018
207	4140	0.112262	0.001094	0			
208	4160	0.116791	0.000541	0			
209	4180	0.119231	0.000259	0			

210 rows × 7 columns

	z	n=1	n=2	n=3	n=4	n=5	n=6
0	0	-1.047687	-2.103465	1.092629	1.875199	2.089374	1.103808
1	20	-1.046850	-0.744241	1.062625	0.163890	2.091342	1.697856
2	40	-1.046517	-0.642753	1.071371	-1.355983	2.086228	1.901724
3	60	-1.045576	-0.537461	1.112584	-2.865189	2.071846	1.472693
4	80	-1.044150	-0.567998	1.066949	1.117619	2.069075	1.673443
...	...	...	...	...	...	...	...
205	4100	-1.051310	2.678173	1.047172	-1.621601	2.157192	-1.581294
206	4120	-1.050252	2.667643	1.021756	-1.712185	2.113739	-1.416793
207	4140	-1.048822	2.635220	1.078683	0.309457	2.105470	-1.644444
208	4160	-1.047880	2.740168	1.049451	-0.912063	2.108699	1.459857
209	4180	-1.047546	2.838829	1.053528	-1.601587	2.100188	-1.282787

210 rows × 7 columns

Magnitudes and phases of multipole coefficients

Sample over 3D grid

Input to *fieldmap* in G4beamline

```
The input file starts with a set of commands to define the parameters
of the map, followed by blocks of lines containing the values of the
field components. The field component names depend on the type of map
(grid: Bx,By,Bz,Ex,Ey,Ez; cylinder: Br,Bz,Er,Ez).
Each command has a specific list of arguments to define parameters
of the map.
```

Excerpt of BLFieldMap file