HMS Delta scan with Hydrogen elastic

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1 Introduction

Do a delta scan of the HMS using hydrogen elastic from -10% to +10%. At $\theta_{HMS} = 13.5^{\circ}$, the Q^2 for elastic hydrogen events is 0.254 GeV^2 and the momentum is 2.078 MeV. With the low Q^2 , rates will be high. Need to have the 2x2 raster on. Use the 4cm LH2 target to have smaller target length. Table 1 summarizes the kinematics and setup.

The HMS magnets need to be cycled to the highest momentum and then the momentum is lowered in 1$ steps. A list of central HMS momentum is given in Table 2. The runs can be short, since only need around 5000 events per setting.

beam energy:	2214 MeV
HMS momentum	2309 - 1889 MeV
HMS angle	13.5 deg
HMS collimator	Pion collimator
beam current:	5 μA
fast raster:	2x2
target:	4cm LH2

Table 1: Kinematics

δ	HMS Central momentum setting
-10	2.309
-9	2.284
-8	2.259
-7	2.234
-6	2.211
-5	2.187
-4	2.165
-3	2.142
-2	2.120
-1	2.099
0	2.078
1	2.057
2	2.037
3	2.017
4	1.998
5	1.979
6	1.960
7	1.942
8	1.924
9	1.906
10	1.889

Table 2: Central momentum settings for scan