1 HMS Surveys

Summary of HMS surveys done mostly during the summer of 2017. Define the pointing in the spectrometer coordinate system with +X downwards and +Y towards smaller angles. Table 1 lists measured mispointing in horizontal and vertical for each survey number and HMS angle. The horizontal mispointing is plotted versus HMS angle in Fig 1 and shows a definite trend with angle. This was see before in the 6 GeV era. Survey at 60 and 70° would be useful to map out the dependence at above 40 degrees, since the 50 degree point indicates that the horizontal mispointing is changing. The vertical mispointing is plotted versus HMS angle in Fig 2 and indicates a slight dependence on angle.

Survey	HMS Angle	Horizontal point (Y_{spec})	Vertical point (X_{spec})
C1809R	50.00	+2.92	+1.07
C1792R	40.534	+3.45	+0.91
C1807R	40.013	+3.29	+0.94
C1842	35.944	+2.67	+0.82
C1842	25.013	+1.47	+0.92
C1842	15.004	+0.76	1.29
C1842	15.005	+0.82	1.45

Table 1: Table of HMS surveys

2 SHMS Surveys

Define the pointing in the spectrometer coordinate system with +X downwards and +Y towards larger angles. Table 2 lists measured mispointing in horizontal and vertical for each survey number and SHMS angle. The horizontal mispointing is plotted versus SHMS angle in Fig 3. The vertical mispointing is plotted versus SHMS angle in Fig 4.

Survey	Angle	Horizontal point (Y_{spec})	Vertical point (X_{spec})
C1812	15.01	-0.74	-1.34
C1806R	15.02	-0.38	-1.16
C1796R	20.32	-0.57	-0.27
C1808R	24.99	-0.43	-1.28
C1810R	39.94	-0.43	-1.25

Table 2: Table of SHMS surveys

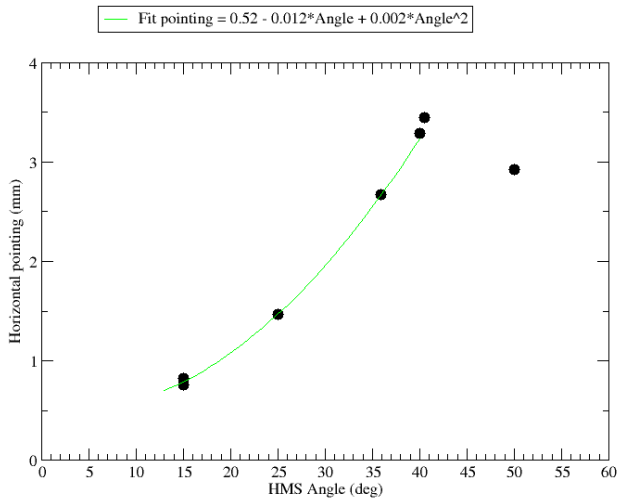

Figure 1: HMS horizontal pointing versus HMS angle. The fit is to the data points at 35 degrees and below.

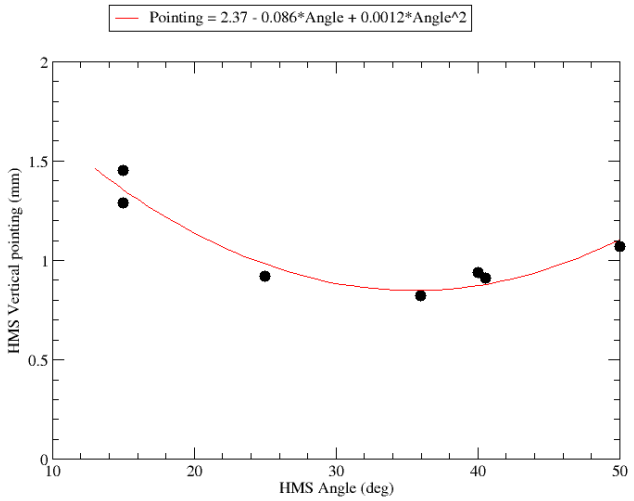

Figure 2: HMS vertical pointing versus HMS angle. The fit is to all the data points.

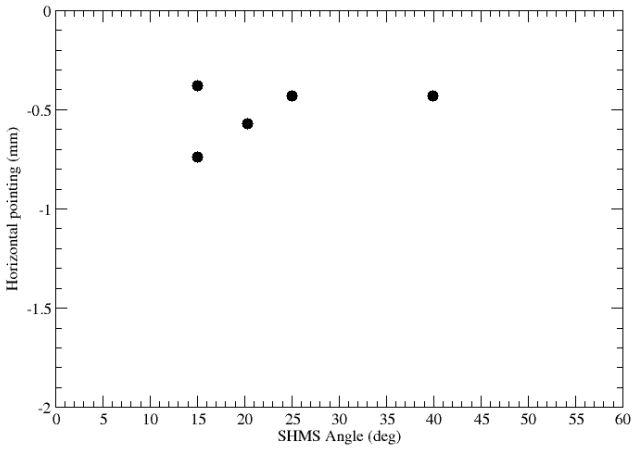

Figure 3: SHMS horizontal pointing versus HMS angle.

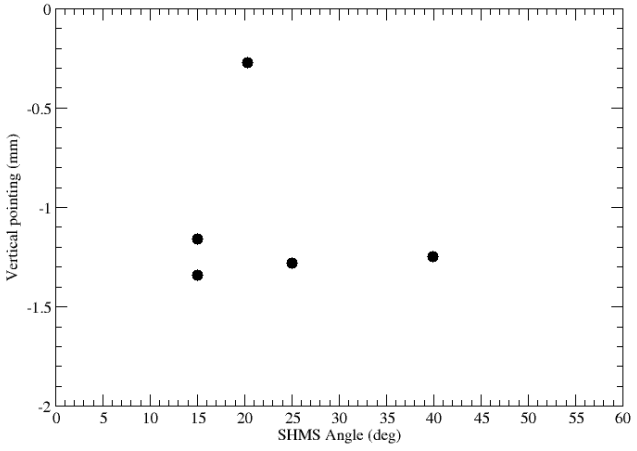

Figure 4: SHMS vertical pointing versus HMS angle.