

Cryostat position

- Indicated in ticks. One tick = 0.39 mm
- Beam axis corresponds to cryostat position

$$X_0 = -15.2 \text{ mm} = 99961 \text{ ticks}$$

- Relation ticks-mm:

$$X[\text{ticks}] = 99\,961 + X[\text{mm}]/0.39$$

(-100 000 if $X[\text{ticks}] > 100000$)

Vertical movement

- Beam vertical position Y1 is defined as the position of table near cryostat indicated in mm (control box in counting room)
- Vertical position of intermediate BPC station Y2 is indicated in Volts (control panel near door PPE156). The table has to be moved according to:

$$Y2[\text{V}] = 0.925 + 0.011 \cdot Y1[\text{mm}]$$

- Current of bend-9 is controlled from beam monitor. It has to be set according formula (do not forget change sign for negative beam):

$$I_{B9}[\text{A}] = \frac{E[\text{GeV}]}{38.14} \cdot Y1[\text{mm}] - 23.8$$

Standard points in Run-2

Point	X mm	X ticks	Y1 mm	Y2 V
A	-160	99551	+140	2.465
B	0	99961	+140	2.465
C	+160	371	+140	2.465
D	-70	99782	+80	1.805
E	+70	140	+80	1.805
F	0	99961	-30	0.595
G	0	99961	-110	-0.285
H	0	99961	-180	-1.055
I	-105	99692	0	0.925
J	+105	230	0	0.925

B9 settings for standard points

E <i>GeV</i>	A, B, C <i>Y1=140</i>	D, E <i>Y1=80</i>	F <i>Y1=-30</i>	G <i>Y1=-110</i>	H <i>Y1=-180</i>	I, J <i>Y1=0</i>
5	-5	-13	-27	-38	-47	-23
10	12	-2	-31	-52	-70	-23
20	49	18	-39	-81	-118	-23
30	86	39	-47	-110	-165	-23
40	123	60	-55	-139	-212	-23
60	196	102	-70	-196	-306	-23
80	269	144	-86	-254	-401	-23
100	343	185	-102	-312	-495	-23
120	416	227	-118	-369	-590	-23
150	526	290	-141	-456	-731	-23
180	636	353	-165	-542	-873	-23
200	710	395	-181	-600	-967	-23

Horizontal scan FCAL

$$Y1 = -180 \text{ mm} \quad Y2 = -1.055 \text{ V}$$

$$I_{B9}(60) = -307 \quad I_{B9}(120) = -590 \quad I_{B9}(200) = -967$$

X, mm	X, ticks
-60	99807
-30	99884
0	99961
30	38
60	115

Horizontal scan in crack

$$Y1 = 0 \quad Y2 = 0.925 \quad I_{B9} = -23$$

X mm	X ticks	X mm	X ticks	X mm	X ticks	X mm	X ticks	X mm	X ticks
-210	99423	-120	99653	-30	99884	+60	115	+150	346
-180	99499	-90	99730	0	99961	+90	192	+180	423
-150	99576	-60	99807	+30	38	+120	269	+210	499

Horizontal scan D-E

$$Y1 = 80 \quad Y2 = 1.805$$

$$I_{B9}(60) = 102 \quad I_{B9}(120) = 227 \quad I_{B9}(200) = 395$$

X mm	X ticks	X mm	X ticks	X mm	X ticks	X mm	X ticks	X mm	X ticks
-120	99653	-70	99782	-20	99910	30	38	80	166
-110	99679	-60	99807	-10	99935	40	64	90	192
-100	99705	-50	99833	0	99961	50	89	100	217
-90	99730	-40	99858	10	99987	60	115	110	243
-80	99756	-30	99884	20	12	70	140	120	269

Horizontal scan EMEC

$$Y1 = +140 \quad Y2 = 2.465$$

$$I_{B9}(60) = 196 \quad I_{B9}(120) = 416 \quad I_{B9}(200) = 710$$

X mm	X ticks	X mm	X ticks	X mm	X ticks	X mm	X ticks	X mm	X ticks
-210	99423	-120	99653	-30	99884	+60	115	+150	346
-180	99499	-90	99730	0	99961	+90	192	+180	423
-150	99576	-60	99807	+30	38	+120	269	+210	499

Central vertical scan

$$X = 0 \quad \text{ticks} = 99961$$

Y1 [mm]	Y2 [V]	I-B9, A		
		60 GeV	120 GeV	200 GeV
-180	-1.055	-306	-590	-967
-150	-0.725	-259	-495	-810
-120	-0.395	-212	-401	-653
-90	-0.065	-165	-306	-495
-60	0.265	-118	-212	-338
-30	0.595	-70	-118	-181
0	0.925	-23	-23	-23
30	1.255	23	70	133
60	1.585	70	164	290
90	1.915	117	259	448
120	2.245	164	353	605
150	2.575	212	448	762
180	2.905	259	542	920
210	3.235	306	636	1077

Left and right vertical scans

X = -120, ticks = 99653 and X = +120, ticks = 269

Y1 [mm]	Y2 [V]	I-B9, A		
		60 GeV	120 GeV	200 GeV
-50	0.375	-102	-181	-285
-40	0.485	-86	-149	-233
-30	0.595	-70	-118	-181
-20	0.705	-55	-86	-128
-10	0.815	-39	-55	-76
0	0.925	-23	-23	-23
10	1.035	-8	7	28
20	1.145	7	39	81
30	1.255	23	70	133
40	1.365	39	102	185
50	1.475	54	133	238
60	1.585	70	164	290
70	1.695	86	196	343
80	1.805	102	227	395
90	1.915	117	259	448
100	2.025	133	290	500
110	2.135	149	322	553
120	2.245	164	353	605
130	2.355	180	385	657
140	2.465	196	416	710
150	2.575	212	448	762
160	2.685	227	479	815
170	2.795	243	511	867
180	2.905	259	542	920
190	3.015	275	573	972
200	3.125	290	605	1024
210	3.235	306	636	1077
220	3.345	322	668	1129