CSC spatial resolution with 2017 data (first results)

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CMS Runs p-p collisions 2017B

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1225 bunches Runs <n> = 44, Lpeak= 7.6×e33cm-2sec-1
Fills: 5837, 5839 and 5840

297046	2017.06.16 19:16 - 20:11	17pb-1	971mbar
297050	2017.06.16 20:50 - 01:57	103pb-1	972mbar
297056	2017.06.17 04:55 - 06:15	28pb-1	972.5mbar
297057	2017.06.17 06:17 - 12:13	116pb-1	972.5mbar

1561 bunches Runs, <n> = 44, Lpeak= 9.7×e33cm-2sec-1,
Fills 5842

297100	2017.06.17 19:40 - 22:08	71pb-1	970mbar
297101	2017.06.17 22:11 - 05:32	162pb-1	970mbar

1741b <n> = 44, Lpeak= 1.09×e34cm-2sec-1
Fills 5845, 5848

297113	2017.06.18 12:42 - 14:17	51pb-1	969.5mbar
297114	2017.06.18 14:20 - 15:27	32pb-1	969mbar
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297176	2017.06.19 19:37 - 20:59	42pb-1	967.5mbar
297177	2017.06.19 21:03 - 22:05	30pb-1	967.5mbar
297178	2017.06.19 22:08 - 07:04	200pb-1	968.5mbar
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2173b Lpeak= 1.4×e34cm-2sec-1, Fill 5856

297292	2017.06.22 02:41 - 07:33	171pb-1	966.5mbar
297293	2017.06.22 07:40 - 08:37	28pb-1	967mbar
297296	2017.06.22 08:46 - 11:57	85pb-1	967.5mbar

2460b Lpeak= 1.44×e34cm-2sec-1 Fill 5873

297503	2017.06.26 01:59 - 07:02	187pb-1	964.5mbar
297505	2017.06.26 08:05 - 10:49	74.5pb-1	963mbar

2317b Lpeak= 1.4×e34cm-2sec-1 Fill 5862

297359	2017.06.23 03:10 - 04:25	41pb-1	967.5mbar

2317b Lpeak= 1.1×e34cm-2sec-1 Fill 5864

297411	2017.06.23 13:22 - 19:32	202pb-1	967.5mbar

2317b <n> = 41. Lpeak= 1.3×e34cm-2sec-1 Fill 5865

297424	2017.06.24 00:29 - 01:27	31pb-1`	968.5mbar
297425	2017.06.24 01:28 - 02:28	41pb-1	968.5mbar
297426	2017.06.24 02:29 - 03:13	26pb-1`	968.5mbar
297430	2017.06.24 04:02 - 05:21	46pb-1	968.5mbar
297432	2017.06.24 06:35 - 07:24	25pb-1	968mbar
297433	2017.06.24 07:40 - 08:41	30pb-1	968.5mbar
297434	2017.06.24 08:41 - 09:43	29pb-1	968.5mbar

2460b Lpeak= 1.48×e34cm-2sec-1 Fill 5868

297467	2017.06.24 19:28 - 20:22	32pb-1	965.5mbar
297468	2017.06.24 20:27 - 20:57	23pb-1	965.5mbar

CMS Runs p-p collisions 2017B

V.Perelygin

2460b Lpeak= 1.40×e34cm-2sec-1 Fill 5872

297483	2017.06.25 05:21 - 06:45	49pb-1	966mbar
297484	2017.06.25 06:46 - 08:10	57pb-1	966mbar
297485	2017.06.25 08:16 -10:58	98pb-1	967.5mbar
297486	2017.06.25 11:04 - 15:07	124pb-1	967 mbar
297487	2017.06.25 15:13 - 19:08	97pb-1	965.5 mbar
297488	2017.06.25 19:16 - 22:07	57pb-1	965mbar

2460b Lpeak= 1.48×e34cm-2sec-1 Fill 5876

297557	2017.06.26 23:16 - 01:50	110pb-1	962mbar
297558	2017.06.27 01:52 - 03:35	67pb-1	961.5mbar
297560	2017.06.27 04:28 - 05:53	48pb-1	960.5mbar
297562	2017.06.27 05:57 - 08:21	72pb-1	960mbar
297563	2017.06.27 08:22 - 10:12	46pb-1	960mbar

2460b Lpeak= 1.35×e34cm-2sec-1 Fill 5878

297599	2017.06.27 15:05 - 17:42	106pb-1	955.5mbar
297603	2017.06.27 17:51 - 20:34	99pb-1	953.5mbar
297604	2017.06.27 20:43 - 23:21	82pb-1	953mbar
297605	2017.06.27 23:21 - 01:59	72pb-1	954mbar
297606	2017.06.28 02:09 - 03:49	37pb-1	955mbar

2556b Lpeak= 1.44×e34cm-2sec-1 Fill 5880

297620	2017.06.28 09:56 - 12:04	82pb-1	952.5mbar

2556b Lpeak= 1.52×e34cm-2sec-1 Fill 5882

297656	2017.06.28 17:14 - 20:02	116pb-1	950mbar
297660	2017.06.28 21:26 - 23:00	51pb-1	951.5mbar
297665	2017.06.29 00:46 - 02:33	59pb-1	952mbar
297666	2017.06.29 02:41 - 03:33	23pb-1	952mbar

2556b Lpeak= 1.44×e34cm-2sec-1 Fill 5883

297674	2017.06.29 07:14 - 08:25	53pb-1	951.5mbar
297675	2017.06.29 08:35 - 11:37	121pb-1	952.5mbar

2556b Lpeak= 1.44×e34cm-2sec-1 Fill 5887

297722	2017.06.29 20:17 - 22:33	93pb-1	957mbar
297723	2017.06.29 23:00 - 00:29	62pb-1	958mbar

CSC Spatial Resolution: selection

Select good quality segment/muon track for spatial resolution measurement:

- segments matched to global muons with P > 10 GeV
- 6 hits on a track segment
- Track-segment χ^2 (2D) criteria
- Cut on large angles dx/dz (local coordinates):

  | dx/dz | < 0.25 for ME11

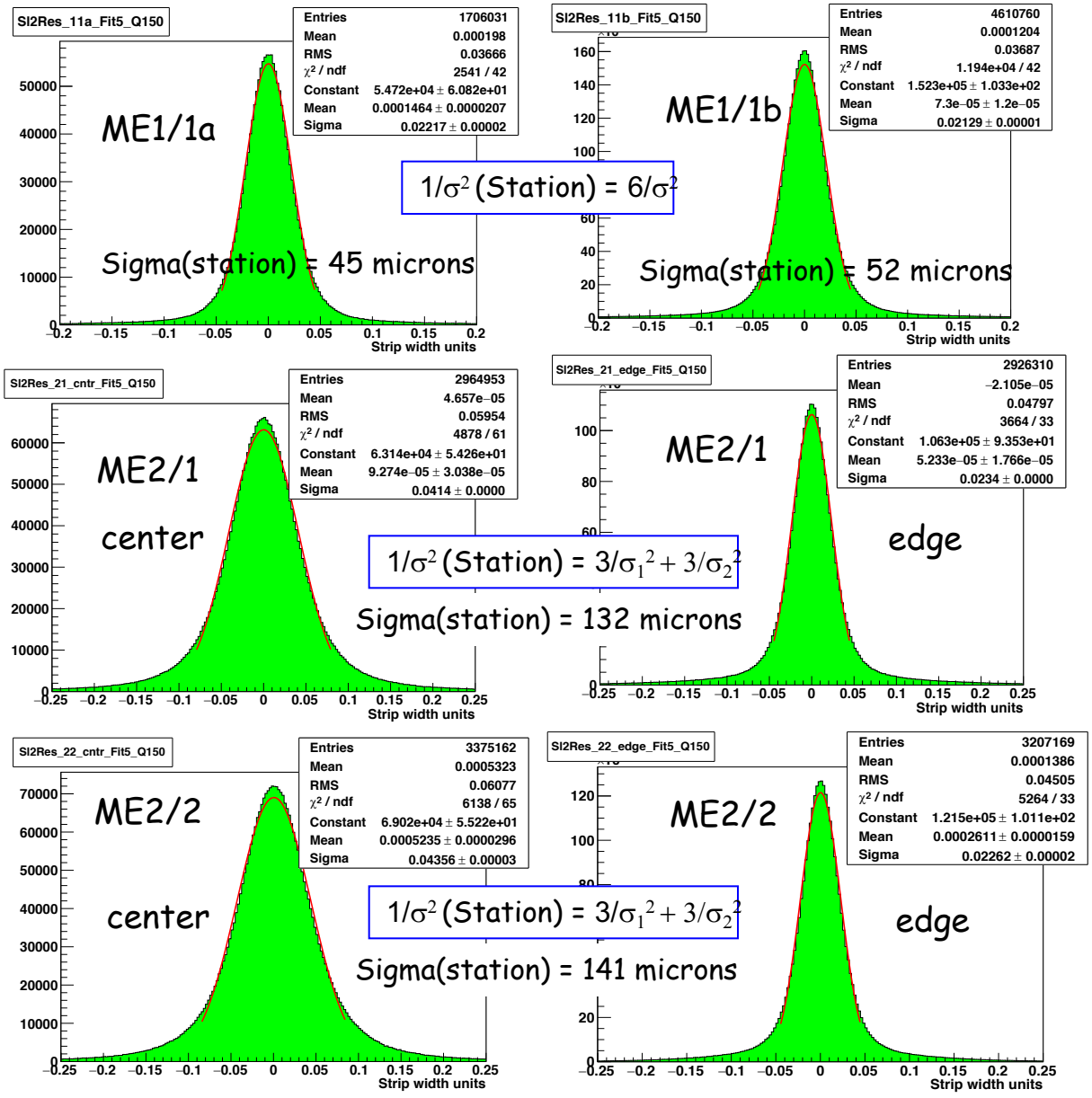
  | dx/dz | < 0.2 for all other stations
- Track-segment χ^2 (strips) criteria
- Sum of charges for 3 strips and 3 time slices:

  $150 < Q_{3x3} < 4000$ ADCs for ME1/1 station

  $150 < Q_{3x3} < 2000$ ADCs for all other stations

Sofware: CMSSW_9_2_3
Dataset: /SingleMuon/Run2017B-ZMu-PromptReco-v1/RAW-RECO

Spatial Resolution: results with 2017B collision data

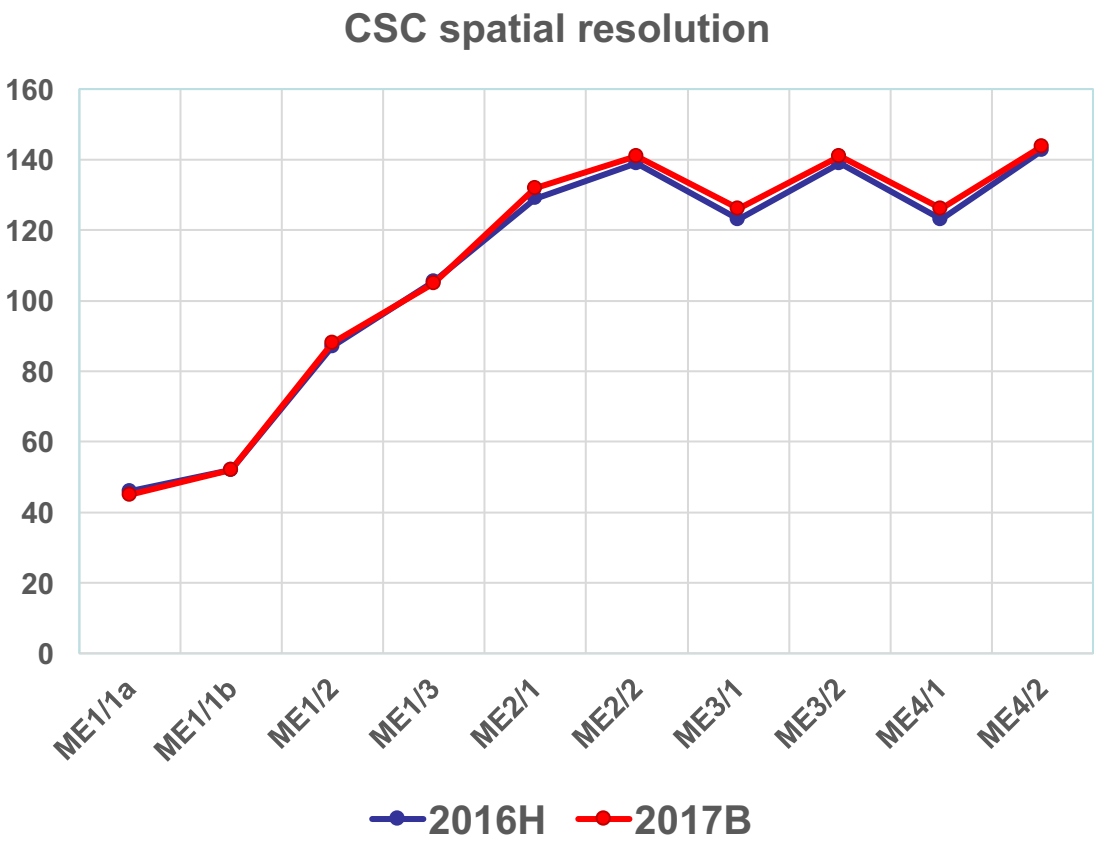


CSC Spatial Resolution 2017

Spatial resolution per station (μm):

Values are normalized to atm.pressure 965 mbar

Station	Collision dataset	
	Run2	
	2016H	2017B
	ZMu	ZMu
ME1/1a	46	45
ME1/1b	52	52
ME1/2	87	88
ME1/3	105	105
ME2/1	129	132
ME2/2	139	141
ME3/1	123	126
ME3/2	139	141
ME4/1	123	126
ME4/2	143	144



Results 2016/2017 are in good agreement

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Spatial Resolution

Spatial resolution calculation:

- Only 6 -point segments are considered;
- For each layer with hit a straight line fit is applied excluding the current layer and the residual (Δ) between the measured strip coordinate and the predicted track coordinate from fit is used for resolution calculation.

- hit used for fit
- hit excluded from fit
- predicted track coordinate