

2015-04-03 Quad1 MEC Alignment

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Optical measurements

E-mail from Gabriel:



Today we measured the metrology for the MEC quad.
Mikhail, could you please update the metrology? It should be applied to all experiments between April 3rd 2015 and June 3rd 2015.
As always, please use only the metrology files provided by Mikhail and not the raw file attached here.
Thanks,
Gabriel and Philip

- [2015-04-03-Quad-MEC-Metrology.xlsx](#) - file with optical measurements from Gabriel
- [2015-04-03-Quad-MEC-Metrology.txt](#) - text version of the same file
- [2015-04-03-Quad-MEC-Metrology-corr.txt](#) - text version of the file with 1-point correction

Quality check

Quality check in X-Y plane:

segm:	S1	S2	dS1	dS2	L1	L2	dL1	dL2	angle(deg)	D1	D2	dD	d
(dS)	d(dL)												
Quad	0												
segm: 0	-20907	-20908	-117	-118	43541	43544	-60	-57	-0.15461	48300	48303		
-3	1	-3											
segm: 1	-20927	-20920	-135	-128	43541	43548	-69	-62	-0.17303	48308	48312		
-4	-7	-7											
segm: 2	-20911	-20911	95	95	-43541	-43552	-43	-54	0.12499	48309	48304		
5	0	11											
segm: 3	-20907	-20913	-38	-44	-43540	-43544	22	18	-0.05395	48302	48302		
0	6	4											
segm: 4	20911	20913	-126	-124	-43232	-43232	-61	-61	0.16566	48024	48023		
1	-2	0											
segm: 5	20909	20912	-311	-308	-43481	-43549	-80	-148	0.40751	48248	48310		
-62	-3	68											
segm: 6	-20909	-20909	-70	-70	-43541	-43541	33	33	-0.09211	48301	48300		
1	0	0											
segm: 7	-20916	-20918	-71	-73	-43545	-43546	38	37	-0.09474	48306	48311		
-5	2	1											

Quality check in Z

segm:	SA	LA	XSize	YSize	dZS1	dZS2	dZL1	dZL2	dZSA	dZLA	ddZS	ddZL	dZX	dZY
angXZ(deg)	angYZ(deg)	dz3(um)												
Quad	0													
segm: 0	-20907	43542	43542	20907	-112	3	-76	39	-54	-18	-115	-115	-18	-54
-0.02369	-0.14799	115.001												
segm: 1	-20923	43544	43544	20923	3	35	7	39	19	23	-32	-32	23	19
0.03026	0.05203	31.995												
segm: 2	-20911	-43546	20911	43546	-21	33	0	54	6	27	-54	-54	6	27
0.01644	0.03553	-53.986												
segm: 3	-20910	-43542	20910	43542	-13	-1	4	16	-7	10	-12	-12	-7	10
-0.01918	0.01316	-11.999												
segm: 4	20912	-43232	43232	20912	-46	6	-45	7	-20	-19	-52	-52	-19	-20
-0.02518	-0.05480	51.999												
segm: 5	20910	-43515	43515	20910	73	40	40	7	56	23	33	33	23	56
0.03028	0.15345	-33.069												
segm: 6	-20909	-43541	20909	43541	-1	-7	-18	-24	-4	-21	6	6	-4	-21
-0.01096	-0.02763	6.000												
segm: 7	-20917	-43545	20917	43545	-3	-7	14	10	-5	12	4	4	-5	12
-0.01370	0.01579	4.000												

Correction

In segment 5 one point has 68um offset.

Correction : line 24 90798 69683 -61

is substituted by 24 90866 69683 -61

Quality check after correction

Quality check in X-Y plane:

segm:	S1	S2	dS1	dS2	L1	L2	dL1	dL2	angle(deg)	D1	D2	dD	d
(dS)	d(dL)												
...													
segm: 5	20909	20912	-311	-308	-43549	-43549	-148	-148	0.40719	48309	48310		
-1	-3	0											
...													

Quality check in Z

segm:	SA	LA	XSize	YSize	dZS1	dZS2	dZL1	dZL2	dZSA	dZLA	ddZS	ddZL	dZX	dZY
angXZ(deg)	angYZ(deg)	dz3(um)												
...														
segm: 5	20910	-43549	43549	20910	73	40	40	7	56	23	33	33	23	56
0.03026	0.15345	-33.006												
...														

Constants

type "center":

199.26	198.39	309.87	97.57	627.18	627.89	711.05	498.16
199.26	198.39	309.87	97.57	627.18	627.89	711.05	498.16
199.26	198.39	309.87	97.57	627.18	627.89	711.05	498.16
199.26	198.39	309.87	97.57	627.18	627.89	711.05	498.16
306.77	94.55	624.16	624.43	514.80	727.65	199.50	199.97
306.77	94.55	624.16	624.43	514.80	727.65	199.50	199.97
306.77	94.55	624.16	624.43	514.80	727.65	199.50	199.97
306.77	94.55	624.16	624.43	514.80	727.65	199.50	199.97
-0.10	-0.34	-0.03	-0.15	0.00	-0.12	0.18	-0.10
-0.10	-0.34	-0.03	-0.15	0.00	-0.12	0.18	-0.10
-0.10	-0.34	-0.03	-0.15	0.00	-0.12	0.18	-0.10
-0.10	-0.34	-0.03	-0.15	0.00	-0.12	0.18	-0.10

type "tilt":

-0.15461	-0.17303	0.12499	-0.05395	0.16566	0.40719	-0.09211	-0.09474
-0.15461	-0.17303	0.12499	-0.05395	0.16566	0.40719	-0.09211	-0.09474
-0.15461	-0.17303	0.12499	-0.05395	0.16566	0.40719	-0.09211	-0.09474
-0.15461	-0.17303	0.12499	-0.05395	0.16566	0.40719	-0.09211	-0.09474

type "geometry":

```

# TITLE      Geometry parameters of CSPAD
# DATE_TIME  2015-06-04 13:57:52 PDT
# METROLOGY  /reg/g/psdm/detector/alignment/cspad/calib-mec-2015-04-03/work/metrology.txt
# AUTHOR     dubrovin
# EXPERIMENT MEC
# DETECTOR   CSPAD
# CALIB_TYPE geometry
# COMMENT:01 Table contains the list of geometry parameters for alignment of 2x1 sensors, quads, CSPAD, etc
# COMMENT:02 All translation and rotation pars of the object are defined w.r.t. parent object Cartesian frame
# PARAM:01 PARENT      - name and version of the parent object
# PARAM:02 PARENT_IND  - index of the parent object
# PARAM:03 OBJECT      - name and version of the object
# PARAM:04 OBJECT_IND  - index of the new object
# PARAM:05 X0          - x-coordinate [um] of the object origin in the parent frame
# PARAM:06 Y0          - y-coordinate [um] of the object origin in the parent frame
# PARAM:07 Z0          - z-coordinate [um] of the object origin in the parent frame
# PARAM:08 ROT_Z       - object design rotation angle [deg] around Z axis of the parent frame
# PARAM:09 ROT_Y       - object design rotation angle [deg] around Y axis of the parent frame
# PARAM:10 ROT_X       - object design rotation angle [deg] around X axis of the parent frame
# PARAM:11 TILT_Z      - object tilt angle [deg] around Z axis of the parent frame
# PARAM:12 TILT_Y      - object tilt angle [deg] around Y axis of the parent frame
# PARAM:13 TILT_X      - object tilt angle [deg] around X axis of the parent frame
# HDR PARENT IND      OBJECT IND      X0[um]  Y0[um]  Z0[um]  ROT-Z  ROT-Y  ROT-X      TILT-Z  TILT-Y  TILT-X

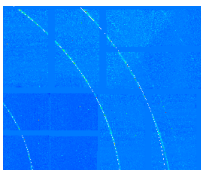
QUAD:V1      0  SENS2X1:V1      0      21902  33719  -11      0      0      0  -0.15461 -0.02369
-0.14799
QUAD:V1      0  SENS2X1:V1      1      21806  10392  -37      0      0      0  -0.17303  0.03026
0.05203
QUAD:V1      0  SENS2X1:V1      2      34061  68607  -3       270     0      0   0.12499  0.01644
0.03553
QUAD:V1      0  SENS2X1:V1      3      10725  68637  -16     270     0      0  -0.05395 -0.01918
0.01316
QUAD:V1      0  SENS2X1:V1      4      68939  56587   0      180     0      0   0.16566 -0.02518
-0.05480
QUAD:V1      0  SENS2X1:V1      5      69017  79982  -12     180     0      0   0.40719  0.03026
0.15345
QUAD:V1      0  SENS2X1:V1      6      78158  21929   20     270     0      0  -0.09211 -0.01096
-0.02763
QUAD:V1      0  SENS2X1:V1      7      54758  21981  -10     270     0      0  -0.09474 -0.01370
0.01579
...
CSPAD:V1     0  QUAD:V1      0      -4500  -4500    0      90      0      0   0.00000  0.00000
0.00000
CSPAD:V1     0  QUAD:V1      1      -4500   4500    0       0      0      0   0.00000  0.00000
0.00000
CSPAD:V1     0  QUAD:V1      2       4500   4500    0     270     0      0   0.00000  0.00000
0.00000
CSPAD:V1     0  QUAD:V1      3       4500  -4500    0     180     0      0   0.00000  0.00000
0.00000

RAIL          0  CSPAD:V1      0         0         0  1000000    0      0      0   0.00000  0.00000
0.00000
IP            0  RAIL          0         0         0         0      0      0      0   0.00000  0.00000
0.00000

```

Alignment check with rings

exp=meci0215:run=55 detector is tilted, so orthogonal to the beam projection does not work well:



Deployment

Parameters for geometry (and old style center and tilt) are available in

Archive: `/reg/g/psdm/detector/alignment/cspad/calib-mec-2015-04-03/calib/calib/CsPad::CalibV1/MecTargetChamber.0:Cspad.0/geometry/`

- `0-end.data` - non-corrected
- `1-end.data` - corrected 68um offset for point 24.

Deployment: for all experiments between April 3rd 2015 and June 3rd 2015.

Summary

In segment 5 one point has 68um offset. Two files are available for corrected and non-corrected optical measurements.

References

- [CSPAD Alignment](#)
- [CSPAD Geometry and Alignment](#)
- [CSPAD Geometry Software](#)
- [CSPAD2x2 Alignment](#)