Studies using Albert plots

Catarina Quintans @ LIP meeting

07/01/2017

Albert plots

In this study one run/chunk per physics week, reconstructed from mass production (t3) was used. The Albert plots generated at the time of production, for DCs, were analysed in detail.

The so-called "Albert plots" were created by Albert Lehmann, as a way to monitor the quality of alignment and reconstruction and pseudo-efficiencies.

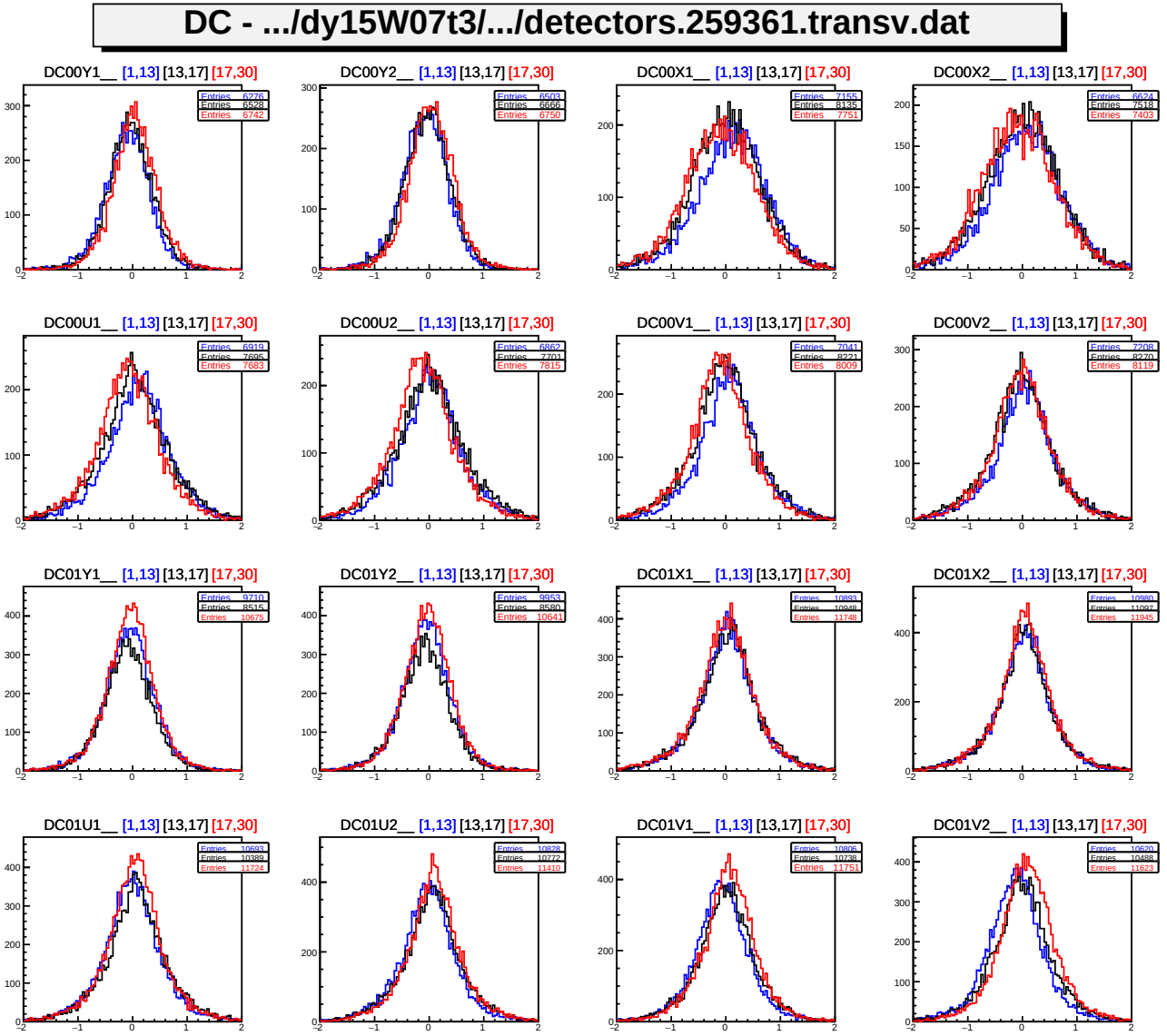
For each plane, 3 equipopulated slices along the direction perpendicular to measurement direction are made, and for each the pseudo-residuals are plotted: "resid −", "resid 0" and "resid +". In the DC's case these distributions are approximately gaussian.

Conditions

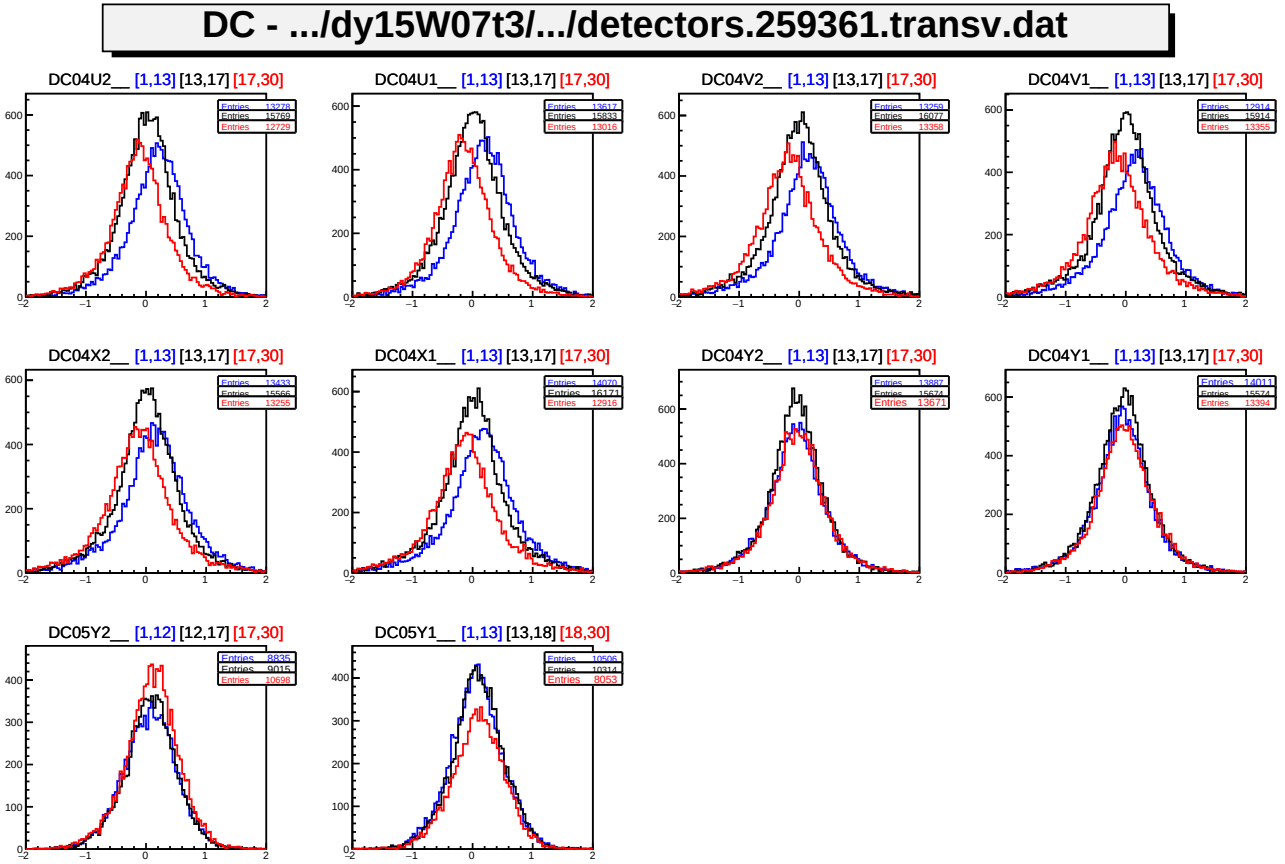
period	run	ION2 ($\times 10^8$/spill)	det.dat
W07-SB1	259576	4.51	det.259361
W07-SB2	259811	4.31	det.259361
W08-SB1	260104	4.26	det.260073
W08-SB2	260559	4.48	det.260073
W09-SB1	260694	4.39	det.260626
W09-SB2	261346	3.46	det.260876
W10-SB1	261602	4.09	det.261513
W10-SB2	261974	3.65	det.261970
W11-SB1	262613	4.26	det.262370
W11-SB2	262859	3.50	det.262370
W12-SB1	263201	4.04	det.263140
W12-SB2	263536	3.86	det.263140*
W13-SB1	263685	3.11	det.263637
W13-SB2	264067	3.63	det.263637
W14-SB1	264193	4.03	det.264163
W14-SB2	264449	3.64	det.264163*
W15-SB1	264655	4.11	det.264619
W15-SB2	264819	4.04	det.264619*

For weeks marked with (*), another alignment run was taken, but it was not used in the production. In each run, chunk 12050 was analysed.

Example (1)


DC - .../dy15W07t3/.../detectors.259361.transv.dat
DC00Y1__ [1,13] [13,17] [17,30]
DC00Y2__ [1,13] [13,17] [17,30]
DC00X1__ [1,13] [13,17] [17,30]
DC00X2__ [1,13] [13,17] [17,30]
DC00U1__ [1,13] [13,17] [17,30]
DC00U2__ [1,13] [13,17] [17,30]
DC00V1__ [1,13] [13,17] [17,30]
DC00V2__ [1,13] [13,17] [17,30]
DC01Y1__ [1,13] [13,17] [17,30]
DC01Y2__ [1,13] [13,17] [17,30]
DC01X1__ [1,13] [13,17] [17,30]
DC01X2__ [1,13] [13,17] [17,30]
DC01U1__ [1,13] [13,17] [17,30]
DC01U2__ [1,13] [13,17] [17,30]
DC01V1__ [1,13] [13,17] [17,30]
DC01V2__ [1,13] [13,17] [17,30]

Example (2)


DC - .../dy15W07t3/.../detectors.259361.transv.dat
DC04U2__ [1,13] [13,17] [17,30]
DC04U1__ [1,13] [13,17] [17,30]
DC04V2__ [1,13] [13,17] [17,30]
DC04V1__ [1,13] [13,17] [17,30]
DC04X2__ [1,13] [13,17] [17,30]
DC04X1__ [1,13] [13,17] [17,30]
DC04Y2__ [1,13] [13,17] [17,30]
DC04Y1__ [1,13] [13,17] [17,30]
DC05Y2__ [1,12] [12,17] [17,30]
DC05Y1__ [1,13] [13,18] [18,30]

Procedure

- Each residual plot is fitted with a gaussian. The mean value and σ are stored.
- One pair of values per week and per plane slice, that are then compared.
- Three criteria are used to mark bad alignment of planes:
  - Red: difference between any of 3 parts larger than the smallest real $\sigma \times 0.25$
  - Blue: resolution larger than the smallest real $\sigma \times 0.1+$ real σ
  - Magenta: all residuals shifted by more than theory $\sigma \times 0.1$

DC00Y1

DC00Y1	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	-93	388	-39	390	40	388	133
W07-SB2	-68	385	-25	398	61	382	129
W08-SB1	-68	381	-47	390	22	387	90
W08-SB2	-78	398	-40	399	28	397	106
W09-SB1	-18	374	-6	398	3	391	21
W09-SB2	-69	390	-54	403	4	395	73
W10-SB1	-34	375	-5	386	26	380	60
W10-SB2	-27	388	0	402	22	386	49
W11-SB1	-27	386	-11	397	32	387	59
W11-SB2	-31	381	-5	400	26	388	57
W12-SB1	-79	384	-45	410	31	395	110
W12-SB2	-85	400	-41	398	29	390	114
W13-SB1	-95	386	-51	412	26	394	121
W13-SB2	-86	401	-54	407	29	388	115
W14-SB1	-26	388	28	399	61	396	87
W14-SB2	-12	381	24	402	47	395	59
W15-SB1	-86	398	-40	408	41	391	127
W15-SB2	-76	396	-31	420	34	398	110

DC00Y2

DC00Y2	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	-74	394	-34	404	33	390	107
W07-SB2	-61	394	-11	403	42	390	103
W08-SB1	-71	393	-15	398	37	383	108
W08-SB2	-64	396	-9	398	34	397	98
W09-SB1	-34	392	2	409	38	387	72
W09-SB2	-67	404	-16	400	35	394	102
W10-SB1	-43	390	1	399	22	377	65
W10-SB2	-34	385	17	403	22	388	56
W11-SB1	-41	381	5	405	18	390	59
W11-SB2	-36	383	17	395	14	386	50
W12-SB1	-68	406	-16	405	38	403	106
W12-SB2	-58	401	-13	398	31	396	89
W13-SB1	-68	395	-24	398	33	390	101
W13-SB2	-66	397	-20	413	40	391	106
W14-SB1	-20	386	35	416	48	402	68
W14-SB2	-14	390	44	408	61	392	75
W15-SB1	-65	396	-26	403	43	393	108
W15-SB2	-50	400	-7	404	34	394	84

DC00X1

DC00X1	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	142	603	3	595	-93	626	235
W07-SB2	140	571	15	605	-76	598	216
W08-SB1	152	590	21	595	-75	622	227
W08-SB2	145	604	30	594	-90	614	235
W09-SB1	50	585	6	601	-27	627	77
W09-SB2	170	599	26	613	-117	607	287
W10-SB1	64	596	-13	590	-51	617	115
W10-SB2	4	568	-20	585	-33	601	37
W11-SB1	37	579	-6	591	-47	596	84
W11-SB2	28	581	-20	578	-25	597	53
W12-SB1	125	607	17	594	-90	638	215
W12-SB2	127	570	8	586	-81	588	208
W13-SB1	158	576	19	571	-86	585	244
W13-SB2	133	581	12	560	-94	578	227
W14-SB1	-4	573	-84	581	-57	609	80
W14-SB2	-6	546	-62	565	-31	595	56
W15-SB1	140	579	15	579	-87	597	227
W15-SB2	156	590	67	592	-84	585	240

DC00X2

DC00X2	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	71	605	13	625	-94	649	165
W07-SB2	104	611	13	628	-90	643	194
W08-SB1	139	641	32	657	-74	679	213
W08-SB2	135	637	18	638	-72	638	207
W09-SB1	2	632	-4	627	-34	619	36
W09-SB2	217	636	44	639	-155	644	372
W10-SB1	14	621	13	611	-37	630	51
W10-SB2	-3	624	11	624	2	617	14
W11-SB1	17	598	0	613	-17	617	34
W11-SB2	24	640	1	622	-11	625	36
W12-SB1	93	638	5	637	-88	657	181
W12-SB2	104	622	15	644	-74	619	178
W13-SB1	102	620	35	629	-69	603	171
W13-SB2	102	603	25	617	-72	614	174
W14-SB1	-47	634	-75	652	-46	647	29
W14-SB2	-10	621	-44	629	-13	618	34
W15-SB1	136	618	23	623	-70	606	206
W15-SB2	126	616	38	630	-79	648	205

DC00U1

DC00U1	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	116	517	23	536	-74	507	190
W07-SB2	110	506	16	530	-76	507	186
W08-SB1	103	519	12	533	-62	511	165
W08-SB2	80	516	2	562	-67	533	147
W09-SB1	44	507	-17	527	-35	522	79
W09-SB2	67	529	7	551	-31	531	98
W10-SB1	49	517	1	541	-62	528	111
W10-SB2	33	527	2	560	-35	537	68
W11-SB1	36	509	0	550	-39	531	75
W11-SB2	37	528	-11	574	-35	522	72
W12-SB1	95	543	5	573	-77	565	172
W12-SB2	78	528	10	572	-99	539	177
W13-SB1	95	536	13	601	-89	583	184
W13-SB2	63	554	4	595	-75	546	138
W14-SB1	-15	538	-45	598	-45	554	30
W14-SB2	-7	520	-28	582	-63	556	56
W15-SB1	84	566	24	603	-60	553	144
W15-SB2	103	578	19	601	-71	576	174

DC00U2

DC00U2	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	15	504	5	542	-111	510	126
W07-SB2	10	510	0	553	-110	514	120
W08-SB1	12	507	8	539	-120	505	132
W08-SB2	-2	523	-11	550	-118	526	116
W09-SB1	-1	509	17	535	-28	518	45
W09-SB2	-35	529	0	533	-91	526	91
W10-SB1	12	510	34	537	-13	534	47
W10-SB2	-7	520	25	580	0	527	25
W11-SB1	-2	519	38	557	-11	528	49
W11-SB2	-17	525	23	572	-6	537	40
W12-SB1	-22	545	-15	581	-97	562	91
W12-SB2	-18	537	-17	585	-103	537	86
W13-SB1	-29	568	-8	609	-97	560	89
W13-SB2	4	559	-18	592	-95	563	99
W14-SB1	-58	543	-53	612	-54	586	5
W14-SB2	-49	540	-28	615	-38	541	21
W15-SB1	-12	555	17	615	-90	579	107
W15-SB2	0	572	-7	602	-67	574	67

DC00V1

DC00V1	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	55	486	-16	511	-88	495	143
W07-SB2	55	491	-8	516	-73	489	128
W08-SB1	46	498	-2	515	-55	500	101
W08-SB2	47	511	0	518	-66	504	113
W09-SB1	11	492	-12	502	-17	495	28
W09-SB2	-1	491	-11	513	-34	503	33
W10-SB1	10	507	-18	515	-25	486	35
W10-SB2	12	531	-7	524	-13	498	25
W11-SB1	14	517	-6	520	-22	499	36
W11-SB2	23	524	-6	530	-29	497	52
W12-SB1	32	518	-6	561	-76	522	108
W12-SB2	44	511	-16	545	-79	514	123
W13-SB1	37	533	0	559	-70	531	107
W13-SB2	44	524	-13	549	-83	527	127
W14-SB1	-4	525	-43	558	-43	526	39
W14-SB2	12	530	-36	546	-38	525	50
W15-SB1	61	546	-3	555	-84	534	145
W15-SB2	83	533	19	565	-49	538	132

DC00V2

DC00V2	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	47	475	-22	498	-8	485	69
W07-SB2	42	491	-24	499	-22	474	66
W08-SB1	61	495	-9	498	-25	484	86
W08-SB2	50	493	-3	525	-31	496	81
W09-SB1	-19	486	-40	498	27	491	67
W09-SB2	86	507	-33	509	-75	496	161
W10-SB1	36	482	-40	491	14	484	76
W10-SB2	-15	510	-17	521	20	499	37
W11-SB1	-6	496	-38	516	18	492	56
W11-SB2	-6	514	-27	538	16	499	43
W12-SB1	39	532	-27	549	-22	511	66
W12-SB2	32	510	-36	521	-26	510	68
W13-SB1	45	539	-8	562	-19	505	64
W13-SB2	30	532	-32	540	-23	506	62
W14-SB1	-26	526	-79	534	-13	504	66
W14-SB2	-3	522	-62	562	-1	498	61
W15-SB1	39	535	-19	567	-19	522	58
W15-SB2	50	545	-16	566	-20	522	70

DC01Y1

DC01Y1	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	-49	423	-83	427	-29	410	54
W07-SB2	-43	423	-89	433	-46	412	46
W08-SB1	-48	431	-82	433	-26	407	56
W08-SB2	-22	446	-70	438	-29	418	48
W09-SB1	-20	418	-44	419	-4	401	40
W09-SB2	-50	436	-65	444	-5	421	45
W10-SB1	-8	425	-29	430	-5	402	24
W10-SB2	-2	429	-29	431	-2	411	27
W11-SB1	1	422	-33	429	-6	408	34
W11-SB2	13	427	-28	430	4	408	41
W12-SB1	-36	438	-70	448	-30	419	40
W12-SB2	-28	428	-75	442	-32	412	50
W13-SB1	-37	443	-92	455	-21	418	71
W13-SB2	-56	450	-90	451	-37	422	53
W14-SB1	-4	437	-16	450	-5	414	12
W14-SB2	0	438	-16	436	-1	415	16
W15-SB1	-29	445	-72	449	-30	428	43
W15-SB2	-19	443	-75	464	-31	423	55

DC01Y2

DC01Y2	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	-54	416	-81	424	-34	415	47
W07-SB2	-63	421	-81	429	-31	412	50
W08-SB1	-46	423	-61	425	-18	416	43
W08-SB2	-30	424	-47	450	-3	422	17
W09-SB1	-27	401	-54	419	-17	404	37
W09-SB2	-28	438	-48	456	15	437	63
W10-SB1	-18	416	-38	418	-13	407	25
W10-SB2	-8	425	-30	416	-5	419	25
W11-SB1	-10	409	-32	421	-7	413	25
W11-SB2	-2	417	-16	434	0	414	16
W12-SB1	-24	429	-54	440	-19	425	35
W12-SB2	-29	434	-60	439	-20	425	40
W13-SB1	-33	442	-68	444	-30	423	38
W13-SB2	-34	438	-90	455	-37	427	56
W14-SB1	-7	421	-16	432	-14	427	9
W14-SB2	-2	425	-9	432	-7	414	7
W15-SB1	-20	443	-57	453	-21	431	37
W15-SB2	-24	451	-69	467	-25	436	45

DC01X1

DC01X1	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	21	470	45	474	12	466	33
W07-SB2	28	466	41	467	8	462	33
W08-SB1	5	459	42	460	35	462	37
W08-SB2	0	476	17	480	21	482	21
W09-SB1	12	459	22	456	6	465	16
W09-SB2	-26	463	17	466	56	471	82
W10-SB1	-4	465	17	462	10	462	21
W10-SB2	7	476	-4	469	-11	482	18
W11-SB1	-2	469	-3	472	-8	470	6
W11-SB2	-13	470	-9	475	-1	472	12
W12-SB1	32	489	54	487	16	491	38
W12-SB2	38	483	46	484	20	478	26
W13-SB1	42	477	59	497	12	474	47
W13-SB2	33	486	67	499	10	475	57
W14-SB1	7	486	-12	487	-18	482	25
W14-SB2	-11	469	-26	486	-14	478	15
W15-SB1	30	487	44	498	9	485	35
W15-SB2	7	504	31	476	-14	504	45

DC01X2

DC01X2	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	37	446	34	444	49	437	15
W07-SB2	33	453	28	458	45	448	17
W08-SB1	33	441	30	447	47	441	17
W08-SB2	14	460	18	460	51	449	37
W09-SB1	1	447	-7	454	32	444	39
W09-SB2	39	460	2	455	-4	444	43
W10-SB1	-14	445	-5	458	41	441	55
W10-SB2	-5	456	-11	457	31	441	42
W11-SB1	4	450	-24	450	20	442	44
W11-SB2	-10	448	-19	456	28	447	47
W12-SB1	28	468	39	474	62	453	34
W12-SB2	38	453	39	470	55	446	17
W13-SB1	45	473	40	485	52	460	12
W13-SB2	43	474	28	491	52	451	24
W14-SB1	13	458	-30	472	14	454	44
W14-SB2	8	456	-36	476	6	452	44
W15-SB1	33	470	20	496	34	454	14
W15-SB2	29	474	19	480	26	453	10

DC01U1

DC01U1	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	-8	464	64	481	38	447	72
W07-SB2	-8	460	63	475	32	447	71
W08-SB1	-49	466	48	475	50	449	99
W08-SB2	-44	476	41	498	34	470	85
W09-SB1	-9	447	29	467	6	455	38
W09-SB2	-145	478	20	489	134	465	279
W10-SB1	-18	461	16	482	-3	448	34
W10-SB2	16	459	21	486	-20	458	41
W11-SB1	-1	445	20	478	-7	449	27
W11-SB2	-10	450	9	476	1	457	19
W12-SB1	-5	475	46	505	23	469	51
W12-SB2	-2	472	58	498	39	461	60
W13-SB1	-1	484	60	523	38	478	61
W13-SB2	5	481	59	519	35	485	54
W14-SB1	13	470	8	501	-25	473	38
W14-SB2	-7	472	1	503	-33	470	34
W15-SB1	0	484	50	521	20	473	50
W15-SB2	-4	486	38	534	18	488	42

DC01U2

DC01U2	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	-15	444	53	466	58	438	73
W07-SB2	-22	444	60	465	83	442	105
W08-SB1	-14	443	62	457	83	439	97
W08-SB2	-32	454	35	477	78	443	110
W09-SB1	-11	429	10	465	27	431	38
W09-SB2	10	441	27	465	9	450	18
W10-SB1	-22	434	10	468	22	438	44
W10-SB2	-24	452	1	466	10	449	34
W11-SB1	-18	432	6	465	24	431	42
W11-SB2	-43	452	-7	462	22	438	85
W12-SB1	-51	472	59	483	98	459	149
W12-SB2	-45	463	48	486	101	450	146
W13-SB1	-25	484	76	494	89	462	114
W13-SB2	-26	482	66	500	105	467	131
W14-SB1	-6	457	4	486	20	454	26
W14-SB2	-15	472	-15	489	9	451	24
W15-SB1	-43	484	51	505	80	458	123
W15-SB2	-54	489	58	514	68	486	122

DC01V1

DC01V1	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	-70	445	12	458	62	442	132
W07-SB2	-75	438	17	466	63	451	138
W08-SB1	-69	448	13	463	62	439	131
W08-SB2	-68	444	8	472	63	445	131
W09-SB1	-19	427	-8	451	-17	436	11
W09-SB2	-87	443	-16	457	72	451	159
W10-SB1	-21	433	-6	456	9	434	30
W10-SB2	5	447	-5	468	-7	447	12
W11-SB1	-15	428	0	460	1	432	16
W11-SB2	-20	435	-10	460	-2	438	18
W12-SB1	-38	456	43	489	85	462	123
W12-SB2	-51	450	38	472	81	447	132
W13-SB1	-38	457	37	492	60	448	98
W13-SB2	-41	454	21	482	61	447	102
W14-SB1	4	441	-24	474	-24	454	28
W14-SB2	-4	440	-14	471	-26	436	22
W15-SB1	-19	458	19	489	35	445	44
W15-SB2	-25	463	7	490	25	454	50

DC01V2

DC01V2	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	-125	458	-8	481	83	460	208
W07-SB2	-116	448	-12	478	78	460	194
W08-SB1	-109	453	-5	474	98	466	207
W08-SB2	-122	460	-24	493	83	478	205
W09-SB1	-49	443	-22	459	11	451	60
W09-SB2	-103	458	-26	489	83	464	186
W10-SB1	-53	443	-14	458	24	441	77
W10-SB2	-29	450	-12	477	5	451	34
W11-SB1	-44	438	-11	462	24	442	68
W11-SB2	-44	441	-22	472	23	441	67
W12-SB1	-88	462	20	495	105	469	193
W12-SB2	-98	467	18	491	96	460	194
W13-SB1	-86	455	17	511	108	454	194
W13-SB2	-87	466	8	492	96	460	183
W14-SB1	-18	456	-32	487	4	460	36
W14-SB2	-22	447	-26	476	4	454	30
W15-SB1	-74	473	-7	499	83	464	157
W15-SB2	-81	472	-11	505	72	460	153

DC04U2

DC04U2	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	209	451	23	420	-114	431	323
W07-SB2	202	446	23	423	-107	423	309
W08-SB1	175	439	45	403	-39	406	214
W08-SB2	172	455	37	426	-45	429	217
W09-SB1	63	428	10	411	-28	424	91
W09-SB2	166	441	41	418	-55	435	221
W10-SB1	71	425	11	407	-30	417	101
W10-SB2	28	442	3	417	-4	423	32
W11-SB1	38	415	-1	406	-3	420	41
W11-SB2	61	432	9	408	1	424	60
W12-SB1	141	442	34	421	-65	440	206
W12-SB2	144	431	50	425	-50	422	194
W13-SB1	129	453	29	439	-51	425	180
W13-SB2	130	435	33	429	-48	424	178
W14-SB1	27	434	1	425	-12	430	39
W14-SB2	31	429	3	422	0	410	31
W15-SB1	120	449	44	431	-39	423	159
W15-SB2	116	448	40	432	-33	430	149

DC04U1

DC04U1	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	173	437	9	437	-144	428	317
W07-SB2	185	454	7	444	-152	434	337
W08-SB1	128	428	10	418	-72	413	200
W08-SB2	116	447	-1	435	-84	433	200
W09-SB1	56	438	15	427	-32	431	88
W09-SB2	121	432	6	427	-106	427	227
W10-SB1	69	425	12	430	-29	415	98
W10-SB2	23	433	2	425	4	428	21
W11-SB1	31	426	3	418	-18	412	49
W11-SB2	45	430	29	421	-14	431	59
W12-SB1	102	447	5	441	-102	442	204
W12-SB2	109	438	8	442	-102	425	211
W13-SB1	87	448	4	444	-100	437	187
W13-SB2	100	438	-1	442	-96	435	196
W14-SB1	12	457	10	442	-5	431	17
W14-SB2	7	439	7	444	2	432	5
W15-SB1	108	447	16	440	-86	439	194
W15-SB2	111	453	26	452	-77	438	188

DC04V2

DC04V2	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	171	453	21	435	-158	459	329
W07-SB2	155	456	6	441	-178	469	333
W08-SB1	101	436	20	402	-96	436	197
W08-SB2	88	453	0	425	-110	454	198
W09-SB1	61	439	34	418	-44	438	105
W09-SB2	106	448	-13	422	-158	447	264
W10-SB1	60	432	22	413	-59	443	119
W10-SB2	17	440	21	427	-18	451	39
W11-SB1	22	429	18	411	-37	434	59
W11-SB2	38	432	33	411	-35	438	73
W12-SB1	85	444	-3	421	-132	456	217
W12-SB2	84	440	9	424	-132	445	216
W13-SB1	74	447	-8	437	-134	455	208
W13-SB2	82	435	20	421	-110	449	192
W14-SB1	-6	444	9	427	-32	453	41
W14-SB2	-1	428	19	398	-22	431	41
W15-SB1	95	434	25	409	-106	435	201
W15-SB2	94	440	31	408	-100	436	194

DC04V1

DC04V1	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	159	468	12	442	-136	464	295
W07-SB2	154	468	-2	433	-147	472	301
W08-SB1	146	460	26	420	-76	450	222
W08-SB2	132	469	8	439	-82	455	214
W09-SB1	46	453	13	441	-25	456	71
W09-SB2	175	466	5	444	-156	468	331
W10-SB1	57	436	9	441	-26	453	83
W10-SB2	18	450	2	434	-12	466	30
W11-SB1	20	440	3	432	-17	445	37
W11-SB2	31	447	6	432	-21	446	52
W12-SB1	87	463	8	443	-81	467	168
W12-SB2	90	457	13	441	-82	454	172
W13-SB1	90	457	6	442	-72	466	162
W13-SB2	92	454	12	445	-61	463	153
W14-SB1	-17	454	-2	444	-12	455	15
W14-SB2	8	451	-10	442	2	441	18
W15-SB1	83	462	14	439	-48	450	131
W15-SB2	91	466	21	446	-32	461	123

DC04X2

DC04X2	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	163	475	35	442	-124	464	287
W07-SB2	156	482	26	445	-122	473	278
W08-SB1	126	445	44	419	-42	439	168
W08-SB2	117	459	36	436	-46	457	163
W09-SB1	45	445	13	434	-43	456	88
W09-SB2	127	467	26	436	-69	461	196
W10-SB1	62	448	15	431	-35	445	97
W10-SB2	20	460	8	434	-22	458	42
W11-SB1	27	436	14	419	-26	443	53
W11-SB2	41	451	27	430	-19	457	60
W12-SB1	80	463	29	437	-64	468	144
W12-SB2	92	451	38	430	-65	442	157
W13-SB1	77	458	37	439	-63	462	140
W13-SB2	75	457	30	434	-52	461	127
W14-SB1	-3	457	-18	442	-27	466	24
W14-SB2	1	454	12	430	-18	456	30
W15-SB1	74	460	42	438	-53	455	127
W15-SB2	75	477	39	439	-33	459	108

DC04X1

DC04X1	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	167	479	15	442	-130	454	297
W07-SB2	161	478	7	446	-134	467	295
W08-SB1	138	458	22	416	-73	429	211
W08-SB2	128	470	11	444	-87	467	215
W09-SB1	52	455	15	440	-19	446	71
W09-SB2	151	459	16	447	-120	459	271
W10-SB1	51	450	12	426	-30	451	81
W10-SB2	15	466	10	442	-9	464	24
W11-SB1	7	441	8	429	-9	438	17
W11-SB2	32	455	24	439	1	444	31
W12-SB1	90	472	24	442	-81	451	171
W12-SB2	89	458	37	447	-59	445	148
W13-SB1	78	468	20	458	-61	455	139
W13-SB2	83	454	18	448	-67	452	150
W14-SB1	-6	459	9	440	-19	454	28
W14-SB2	-1	454	3	444	-4	445	7
W15-SB1	88	460	23	457	-61	452	149
W15-SB2	94	464	41	464	-54	453	148

DC04Y2

DC04Y2	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	8	433	8	420	21	426	13
W07-SB2	-44	430	-40	403	-24	421	20
W08-SB1	13	413	11	399	28	413	17
W08-SB2	-2	431	-2	414	9	426	11
W09-SB1	17	410	12	392	5	406	12
W09-SB2	-16	451	-30	445	-3	458	27
W10-SB1	0	406	-7	384	-20	402	20
W10-SB2	-7	413	-6	390	-10	411	4
W11-SB1	-2	405	-14	380	-8	399	12
W11-SB2	-7	407	-22	387	-25	402	18
W12-SB1	-16	432	-17	409	15	429	32
W12-SB2	-18	420	-5	400	24	424	42
W13-SB1	4	432	2	403	35	419	33
W13-SB2	6	422	3	405	29	421	26
W14-SB1	-7	413	-25	388	-15	411	18
W14-SB2	-11	410	-32	380	-22	399	21
W15-SB1	5	432	1	406	24	428	23
W15-SB2	21	442	8	406	28	432	20

DC04Y1

DC04Y1	resid −	resol −	resid 0	resol 0	resid +	resol +	|diff|
W07-SB1	3	430	1	430	15	448	14
W07-SB2	-44	421	-43	419	-20	435	24
W08-SB1	-14	417	-14	409	17	425	31
W08-SB2	-25	434	-29	433	-5	440	24
W09-SB1	-2	415	10	393	6	419	12
W09-SB2	-45	432	-57	430	-14	452	43
W10-SB1	0	411	-3	390	-10	418	10
W10-SB2	-4	409	-13	396	-6	431	9
W11-SB1	-3	398	-11	396	-5	416	8
W11-SB2	-21	406	-21	393	-18	425	3
W12-SB1	-21	426	-18	418	10	452	31
W12-SB2	-21	417	-16	410	16	439	37
W13-SB1	-8	430	-16	411	17	441	33
W13-SB2	-13	417	-12	410	22	443	35
W14-SB1	-16	419	-30	398	-16	429	14
W14-SB2	-19	410	-30	384	-24	420	11
W15-SB1	31	421	14	418	28	442	17
W15-SB2	36	441	14	428	30	446	22

What conclusions?

- Globally, weeks **W09-SB1**, **W10-SB1/2**, **W11-SB1/2** and **W14-SB1/2** have alignment ok in what concerns Saclay DC's.
- Globally DC00X1/X2 has much worse resolution than any of the other planes. Maybe the pitch/Z-position is not ok?
- DC00 alignment could be improved for weeks **W07-SB1/2**, **W08-SB1/2**, **W12-SB1/2**, **W13-SB1/2** and **W15-SB1/2**.
- DC01Y1/Y2 globally a bit misaligned – X/Y centering(?)
- DC04 alignment should be improved for weeks **W07-SB1/2**, **W08-SB1/2**, **W09-SB2**, **W12-SB1/2**, **W13-SB1/2** and **W15-SB1/2**
- The pitch is varying from week to week too much.
  $RMS_{pitch} \times N_{ch} \geq 2 - 3\sigma$s of the planes resolution. Is this normal?

DC04U1/2 alignments

week	Xcen	Ycen	1st wire	angle	pitch	Xcen	Ycen	1st wire	angle	pitch
W07	0.29065	-0.47187	-102.097	-10.06	0.7991933	0.28541	-0.49424	-101.679	-10.068	0.7990496
W08	0.2892	-0.46036	-102.089	-10.063	0.7991304	0.28373	-0.49511	-101.667	-10.072	0.7989541
W09	0.27966	-0.44497	-102.127	-10.06	0.7994288	0.27359	-0.45784	-101.709	-10.063	0.7992862
W09	0.28487	-0.44329	-102.060	-10.067	0.7989071	0.27972	-0.48306	-101.642	-10.072	0.798761
W10	0.2856	-0.48529	-102.121	-10.06	0.7993856	0.2794	-0.49832	-101.703	-10.064	0.7992363
W10	0.2884	-0.48801	-102.150	-10.056	0.7996055	0.2825	-0.50168	-101.731	-10.059	0.7994593
W11	0.24483	-0.45748	-102.142	-10.054	0.7995441	0.23909	-0.47112	-101.724	-10.058	0.7994047
W12	0.25289	-0.46071	-102.134	-10.054	0.7994801	0.24725	-0.49213	-101.716	-10.061	0.7993431
W13	0.25294	-0.4683	-102.173	-10.063	0.7997883	0.24709	-0.49961	-101.754	-10.072	0.7996418
W14	0.26827	-0.47808	-102.267	-10.062	0.8005232	0.26205	-0.49	-101.845	-10.066	0.8003571
W15	0.2572	-0.47928	-102.225	-10.062	0.8001954	0.25078	-0.50429	-101.809	-10.069	0.8000701

(Largest pitch difference between weeks) $\times$256 channels: 4.14 mm (DC04U1); 4.09 mm (DC04U2)

RMS_{pitch} between weeks $\times$256 channels: 1.20 mm (DC04U1); 1.20 mm (DC04U2)

Planes resolution DC04U1/U2: 0.286 mm