

# Slot pre-assignment for sector 81

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- Strategy : minimize the effective b2 spread per octant by choosing the appropriate phase advance.

- Basis :

- measurements at warm done in industry

- assume that the average b2 per octant is zero (compensate with power supply)

- Constraints/difficulties :

- hardware

- warm-cold correlation not as good after material with out-of-tolerance permeability has been used



# hardware constraints

From Michele Modena (SSS coordinator) :

- 10 types of SSS for 47 places (Q11 to Q11)
- 2 SSS can go only in one place : they are the seed for the optimization.

Priority order	Point	SSS	Cryostat	Cold mass	CM order number	CM delivery (earliest)	Cold mass delivery	Cryostat assembly (start)	Cold meas. (start)	BPM + beam screen (start)	Transport
1	12L1	LQATI	QQAGS	LQMTF	75	28-Sep-04	done	done	done	19-07-04	4/10/04
2	14L1	LQATI	QQAGS	LQMTF	74	29-Oct-04	done	on work	19/07/04	26-07-04	11/10/04
3	16L1	LQATI	QQAGS	LQMTF	73	11/16/04	done	28-06-04	02/08/04	09-08-04	18/10/04
4	18L1	LQATI	QQAGS	LQMTF	72	29-Oct-04	done	on work	26/07/04	02-08-04	18/10/04
5	20L1	LQATI	QQAGS	LQMTF	71	29-Sep-04	done	done	done	02-08-04	25/10/04
6	22L1	LQOAH	QQAGS	LQMOF	69	21-Sep-04	done	done	done	16-08-04	1/11/04
7	24L1	LQOAH	QQAGS	LQMOF	68	12-Aug-04	done	done	done	09-08-04	1/11/04
8	26L1	LQOAH	QQAGS	LQMOF	67	12-Aug-04	done	done	done	on work	8/11/04
9	28L1	LQOAN	QQAGS	LQMOL	66	10-Aug-04	done	done	done	23-08-04	15/11/04
10	30L1	LQOAH	QQAGS	LQMOF	64	5-Aug-04	done	done	NCR	16-08-04	15/11/04
11	32L1	LQOAN	QQAGS	LQMOL	90		12-07-04	19-07-04	23/08/04	30-08-04	22/11/04
12	32R8	LQOAH	QQAGS	LQMOF	65	10-Aug-04	done	done	done	20-09-04	29/11/04
13	34R8	LQOAN	QQAGS	LQMOL	35	28-May-04	done	done	done	on work	29/11/04
14	30R8	LQOAN	QQAGS	LQMOL	32	13-May-04	done	done	11/10/04	18-10-04	6/12/04
15	26R8	LQOAH	QQAGS	LQMOF	52	22-Jul-04	done	done	NCR	08-11-04	13/12/04
16	28R8	LQOAH	QQAGS	LQMOF	53	27-Jul-04	done	NCR	done	15-11-04	13/12/04
17	24R8	LQOAH	QQAGS	LQMOF	51	22-Jul-04	done	done	done	06-12-04	3/1/05
18	20R8	LQATI	QQAGS	LQMTF	63	21-Sep-04	done	NCR	13/12/04	03-01-05	10/1/05
19	22R8	LQOAH	QQAGS	LQMOF	50	20-Jul-04	done	done	done	on work	10/1/05
20	18R8	LQATI	QQAGS	LQMTF	62	3-Aug-04	done	done	done	10-01-05	17/1/05
21	14R8	LQATI	QQAGS	LQMTF	55	29/6/04	08-11-04	15-11-04	03/01/05	10-01-05	24/1/05
22	16R8	LQATI	QQAGS	LQMTF	61	3-Aug-04	done	done	done	17-01-05	24/1/05
23	12R8	LQATI	QQAGS	LQMTF	54	27-Jul-04	done	done	done	17-01-05	31/1/05
24	31L1	LQOAS	QQACS	LQMOO	91		22-11-04	29-11-04	17/01/05	24-01-05	28/2/05
25	31R8	LQOAS	QQACS	LQMOO	89		-	22-11-04	10/01/05	17-01-05	28/2/05
26	33L1	LQOBC	QQAFS	LQMOS	34	13-May-04	done	done	17/01/05	24-01-05	28/2/05
27	33R8	LQOBG	QQADS	LQMOT	173	17/8/04	done	22-11-04	10/01/05	17-01-05	28/2/05
28	27L1	LQASD	QQACS	LQMOS	93		29-11-04	06-12-04	24/01/05	31-01-05	7/3/05
29	27R8	LQASD	QQACS	LQMOS	88		22-11-04	29-11-04	17/01/05	24-01-05	7/3/05
30	29L1	LQOBC	QQAFS	LQMOS	92	7-Sep-04	done	on work	24/01/05	31-01-05	7/3/05
31	29R8	LQOBC	QQAFS	LQMOS	57	29-Jul-04	done	on work	17/01/05	24-01-05	7/3/05
32	23L1	LQASD	QQACS	LQMOS	94		06-12-04	13-12-04	31/01/05	07-02-05	14/3/05
33	23R8	LQASD	QQACS	LQMOS	87		29-11-04	06-12-04	24/01/05	31-01-05	14/3/05
34	25L1	LQOAO	QQAFS	LQMOM	95	7-Sep-04	done	on work	31/01/05	07-02-05	14/3/05
35	25R8	LQOAO	QQAFS	LQMOM	56	29-Jul-04	done	done	on work	31-01-05	14/3/05
36	8L1	LQNCB	QQDAS	LMQMD	617		done	on work	31/01/05	07-02-05	14/3/05
37	10L1	LQNCB	QQDAS	LMQMD	615		done	on work	07/02/05	14-02-05	21/3/05
38	19L1	LQATN	QQACS	LQMTI	97		13-12-04	03-01-05	07/02/05	14-02-05	21/3/05
39	19R8	LQATN	QQACS	LQMTI	86		06-12-04	13-12-04	31/01/05	07-02-05	21/3/05
40	21L1	LQATJ	QQAFS	LQMTG	96	12-Oct-04	done	03-01-05	07/02/05	14-02-05	21/3/05
41	21R8	LQATJ	QQAFS	LQMTG	80	19-Aug-04	done	on work	07/02/05	14-02-05	21/3/05
42	15L1	LQATN	QQACS	LQMTI	99		03-01-05	10-01-05	14/02/05	21-02-05	28/3/05
43	15R8	LQATN	QQACS	LQMTI	85		03-01-05	10-01-05	14/02/05	21-02-05	28/3/05
44	17L1	LQATJ	QQAFS	LQMTG	98	21-Sep-04	done	on work	14/02/05	21-02-05	28/3/05
45	17R8	LQATJ	QQAFS	LQMTG	79	29-Oct-04	done	10-01-05	14/02/05	21-02-05	28/3/05
46	10R8	LQNCB	QQDAS	LMQMD	614		done	on work	28-02-05	28-02-05	4/4/05
47	11L1	LQTCB	QQDES	LMQTC			17-01-05	24-01-05	28/02/05	07-03-05	4/4/05
48	11R8	LQTCB	QQDES	LMQTC			10-01-05	17-01-05	21/02/05	28-02-05	4/4/05
49	13L1	LQATV	QQAFS	LQMTG	100	28-Sep-04	done	on work	21/02/05	28-02-05	4/4/05
50	13R8	LQATV	QQAFS	LQMTG	58	19-Aug-04	done	done	on work	28-02-05	4/4/05
51	6R8	LQNLF	QQMAN	LMQMJ	610		17-01-05	24-01-05	28/02/05	07-03-05	11/4/05
52	7R8	LQNFE	QQMBL	LMQME	611		done	24-01-05	28/02/05	07-03-05	11/4/05
53	8R8	LQNCB	QQDAS	LMQMD	612		done	done	on work	07-03-05	11/4/05
54	9L1	LQNJE	QQDHS	LMQMHS	616	24-Nov-04	done	31-01-05	07/03/05	14-03-05	11/4/05
55	9R8	LQNJB	QQDGS	LMQMHS	613		done	on work	07/03/05	14-03-05	11/4/05
56	7L1	LQNFA	QQMBK	LMQMF	618		24-01-05	31-01-05	07/03/05	14-03-05	18/4/05

spec. bus bar test

SSS type to be verif

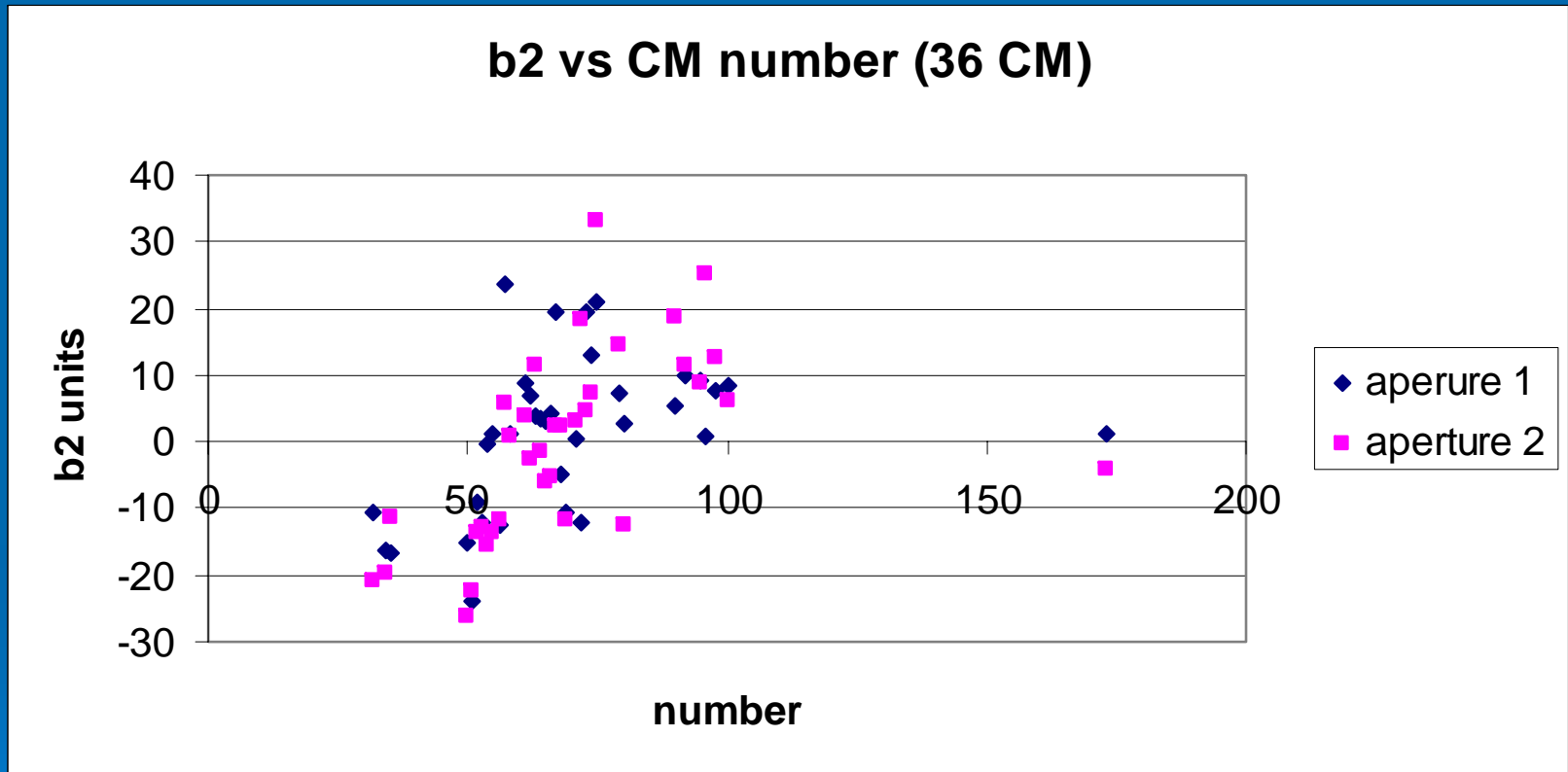
Sector 8-1 SSS-MS

4R8	LQYED	QQMAR	LMQYI	608	15/06/04						
5R8	LQYFC	QQMAT	LMQYE	609	30/06/04						
6L1	LQNDD	QQMAE	LMQMM	619	-						
5L1	LQNDC	QQMAE	LMQMN	620	-						
4L1	LQYCF	QQMAG	LMQYC	621	-						

30/ 4/ 04 Dates proposed by AT-MEL / MAS

**READY FOR LHC INSTALLATION**  
 SMI2 - BPM+ beam screen integration  
 904 - at stripping  
 SM18 - at cold tests  
 at cryostat assembly  
 CM available

# Warm measurements results



zero= average of integrated gradient over the two apertures

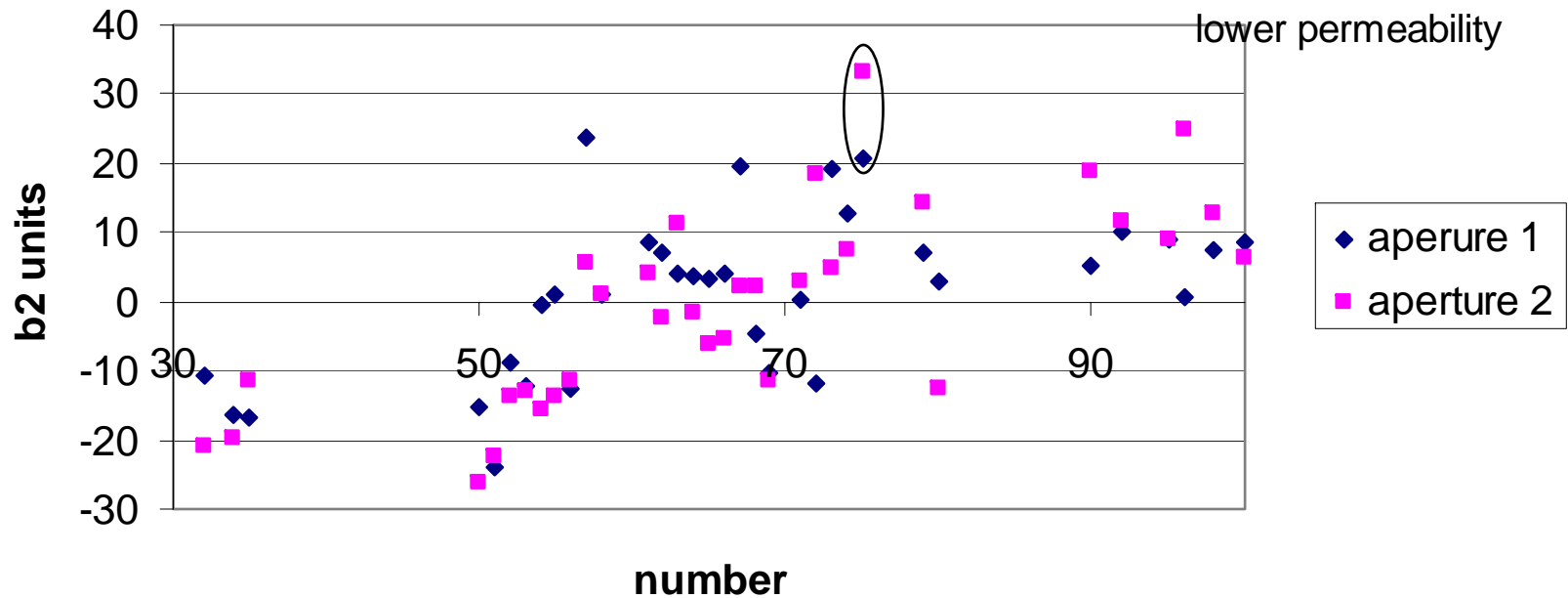
# Warm measurements

- missing measurements of 11 SSS.
- 2 SSS have out-of-tolerance permeability (number 73 and 75: tried to pair them but not possible)

# Warm measurements

b2 vs CM number (36 CM)

ONLY 73 and 75 seem to have lower permeability



# warm measurements

- 70% of the measured SSS have the  $b_2$  of the same sign in both apertures.
- 30% of the SSS have  $b_2$  within 10 units ( $b_2 = \pm 10$ )





# pre-assignment

position	CMid	b2-units-ap1	b2-units-ap2
11R8			
12R8		55	1.212382
13R8		80	2.767468
14R8		71	0.248981
15R8			
16R8		63	3.92846
17R8		58	1.014764
18R8		62	7.089417
19R8			
20R8		75	20.79185
21R8		79	7.26192
22R8		68	-4.78901
23R8			
24R8		64	3.533655
25R8		56	-12.5702
26R8		69	9.93006

position	CMid
11R8	
12R8	55
13R8	80
14R8	71
15R8	
16R8	63
17R8	58
18R8	62
19R8	
20R8	75 ????
21R8	79
22R8	68
23R8	
24R8	64
25R8	56
26R8	69
27R8	
28R8	50
29R8	92
30R8	90
31R8	
32R8	65
33R8	173
34R8	66
33L1	34
32L1	35
31L1	
30L1	51
29L1	57
28L1	32
27L1	
26L1	53
25L1	95
24L1	52
23L1	
22L1	67
21L1	96
20L1	74
19L1	
18L1	73 ???
17L1	98
16L1	54
15L1	
14L1	61
13L1	100
12L1	72
11L1	

# conclusions

- pre-assignment of the SSS available for sector 81 is done
- 2 sss have out-of-tolerance permeability and their position is only provisionally assigned.
- the effective b2 over the sector 81 could be reduced significantly
- 25% of the SSS are still missing and can change the result.