



Database for layout between D1 and D2 LSS R5

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Database for layout between D1 and D2 LSS R5
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OUTLINE

- LHC database - tooling
- Hi-Lumi Vacuum layout between D1 and D2.
- Draft Hi-Lumi Vacuum layout
- Conclusions & next steps.

LHC database



LHC database - tooling

- Slot view of VAC forms

→ is possible to check the ring regions and add or remove equipment.

- Slot → component's position in the ring.
- Slot type → component name.

- Example → VAMQA.4R5.X

Window
VACUUM LAYOUT

Region Filter: LSSR5 Phase Filter: 1 - 1st LSS Installation Go to SLOT TYPES SHOW LEGEND

INTERNAL BEAM EXTERNAL BEAM INTERNAL BEAM - PARAMS EXTERNAL BEAM - PARAMS

BEAM I

Slot ID	Type	From IP	Length	DCUM Start	DCUM End	Name	U	V	A	B	C	Beam	Family	Note	Phase Start	Phase End	Status
1582216	VC5E	10.715	7.595	13332.5616	13340.1566	VC5E.1R5.X	0	0	0	0	0	IE	X - ONE BEA...		1	2	INSTALLED
1582215	VC5H	10.715	2.644	13340.1566	13342.8006	VC5H.1R5.X	0	0	0	0	0	IE	X - ONE BEA...		1	2	INSTALLED
+ 1582214	VC5CT	13.359	2.709	13342.8006	13345.5096	VC5CT.1R5.X	0	0	0	0	0	IE	X - ONE BEA...	3 VP1XE, 2	1	2	INSTALLED
1582217	VBX5A	16.068	.312	13345.5096	13345.8216	VBX5A.1R5.X	0	0	0	0	0	IE	X - ONE BEA...		1	2	INSTALLED
1582213	VC5F	16.38	1.65	13345.8216	13347.4716	VC5F.1R5.X	0	0	0	0	0	IE	X - ONE BEA...		1	2	INSTALLED
+ 1582212	VP5FR	18.03	.47	13347.4716	13347.9416	VP5FR.1R5.X	0	0	0	0	0	IE	X - ONE BEA...	VP1XF, VGI,	1	2	INSTALLED
1582211	VBX5B	18.5	.5	13347.9416	13348.4416	VBX5B.1R5.X	0	0	0	0	0	IE	X - ONE BEA...		1	2	INSTALLED
1582210	VFCDO	21.13	.02	13350.5716	13350.5916	VFCDO.A1R5.X	0	0	0	0	0	IE	X - ONE BEA...		1	2	INSTALLED
1582209	VWGST	21.15	.075	13350.5916	13350.6666	VWGST.1R5.X	0	0	0	0	0	IE	X - ONE BEA...		1	2	INSTALLED
1582208	VMTBF	21.225	.231	13350.6666	13350.8976	VMTBF.1R5.X	0	0	0	0	0	IE	X - ONE BEA...	LS1	1	2	INSTALLED
+ 3809111	VAX5B	21.8	.38	13351.2416	13351.6216	VAX5B.1R5.X	0	0	0	0	180	IE	X - ONE BEA...	VGI, VGPB,	1	2	INSTALLED
+ 885624	VAMQA180	57.972	.18	13387.4136	13387.5936	VAMQA.4R5.X	0	0	0	0	0	IE	X - ONE BEA...	VMAAQ with	1	2	INSTALLED
1041409	VFCDM	58.152	.02	13387.5936	13387.6136	VFCDM.4R5.X	0	0	0	0	0	IE	X - ONE BEA...		1	2	INSTALLED
+ 283180	VaelN161	58.457	.645	13387.8986	13388.5436	VaelN.4R5.X	0	0	0	0	0	IE	X - ONE BEA...	VVFMT on s	1	2	INSTALLED
885623	VCTNC	59.102	2	13388.5436	13388.7436	VCTNC.4R5.X	0	0	0	0	180	IE	X - ONE BEA...		1	2	INSTALLED
885622	VMCKB	63.218	.35	13392.6596	13393.0096	VMCKB.A4R5.X	0	0	0	0	180	IE	X - ONE BEA...	(RF transi	1	2	INSTALLED
+ 885621	VAMGD	67.484	.35	13396.9256	13397.2756	VAMGD.A4R5.X	0	0	0	0	180	IE	X - ONE BEA...	-...-VPIB (F	1	2	INSTALLED
885620	VMCKB	71.75	.35	13401.1916	13401.5416	VMCKB.B4R5.X	0	0	0	0	180	IE	X - ONE BEA...	(RF transi	1	2	INSTALLED
+ 885619	VAMGD	76.016	.35	13405.4576	13405.8076	VAMGD.B4R5.X	0	0	0	0	180	IE	X - ONE BEA...	-...-VPIB (F	1	2	INSTALLED
885618	VMCKB	80.282	.35	13409.7236	13410.0736	VMCKB.C4R5.X	0	0	0	0	180	IE	X - ONE BEA...	(RF transi	1	2	INSTALLED
885617	VMCKB	84.548	.35	13413.9896	13414.3396	VMCKB.D4R5.X	0	0	0	0	180	IE	X - ONE BEA...	(RF transi	1	2	INSTALLED
+ 885616	VCTNB	84.898	4.102	13414.3396	13418.4416	VCTNB.4R5.X	0	0	0	0	0	IE	X - ONE BEA...		1	2	INSTALLED
885615	VMBGA	89	.4	13418.4416	13418.8416	VMBGA.A4R5.X	0	0	0	0	180	IE	X - ONE BEA...	(RF transi	1	2	INSTALLED
+ 885614	VCDW	89.4	5.9	13418.8416	13424.7416	VCDW.A4R5.X	0	0	0	0	0	IE	X - ONE BEA...		1	2	INSTALLED
+ 885613	VAMGA	95.3	.4	13424.7416	13425.1416	VAMGA.4R5.X	0	0	0	0	180	IE	X - ONE BEA...	-VGI-, VPIB	1	2	INSTALLED

LHC database - tooling

- Internal beam parameters

→ to match upstream and downstream inner diameter and flanges.

SlotID	From IP	Length	DCUM Start	DCUM End	Name	U	B	C	Beam	Family	Phase Start	Phase End	Upstream Inner Diameter	Downstream Inner Diameter	Upstream Flange	Downstream Flange
1582216	3.12	7.595	13332.5616	13340.1566	VC5E.1R5.X	0	0	0	IE	X-ONE BEA...	1	2			DN92 Helicofl	DN250 CF-F
1582216	10.715	2.644	13340.1566	13342.8006	VC5H.1R5.X	0	0	0	IE	X-ONE BEA...	1	2			DN250 CF-F	DN250 CF-F
1582214	13.359	2.709	13342.8006	13345.5096	VC5CT.1R5.X	0	0	0	IE	X-ONE BEA...	1	2			DN335 Helicofl	DN100 CF-R
1582217	16.068	.312	13345.5096	13345.8216	VBX5A.1R5.X	0	0	0	IE	X-ONE BEA...	1	2	0.063	0.063	DN100 CF-F	DN100 CF-F
1582213	16.38	1.65	13345.8216	13347.4716	VC5F.1R5.X	0	0	0	IE	X-ONE BEA...	1	2			DN100 CF-R	DN150 CF-F
1582212	18.03	.47	13347.4716	13347.9416	VP5FR.1R5.X	0	0	0	IE	X-ONE BEA...	1	2	0.1	0.1	DN150 CF-F	DN150 CF-F
1582211	18.5	.5	13347.9416	13348.4416	VBX5B.1R5.X	0	0	0	IE	X-ONE BEA...	1	2	0.063	0.063	DN150 CF-R	Remote helico
1582210	21.13	.02	13350.5716	13350.5916	VFCDO.A1R5.X	0	0	0	IE	X-ONE BEA...	1	2	0.063	0.063	DN63	DN100
1582209	21.15	.075	13350.5916	13350.6666	WGST.1R5.X	0	0	0	IE	X-ONE BEA...	1	2	0.063	0.063	DN100	DN100
1582208	21.225	.231	13350.6666	13350.8976	VMTBF.1R5.X	0	0	0	IE	X-ONE BEA...	1	2	0.063	0.063	DN100CF-F	DN100CF-R
380911	21.8	.38	13351.2416	13351.6216	VAMQB.1R5.X	0	0	180	IE	X-ONE BEA...	1	2	0.063	0.063	DN100	DN63
885624	57.972	.18	13387.4136	13387.5936	VAMQA.4R5.X	0	0	0	IE	X-ONE BEA...	1	2	0.08	0.08	DN100	DN100
1041409	58.152	.02	13387.5936	13387.6136	VFCDO.4R5.X	0	0	0	IE	X-ONE BEA...	1	2	0.08	0.08	DN100	DN100
283180	58.457	.645	13387.8986	13388.5436	VAELN.4R5.X	0	0	0	IE	X-ONE BEA...	1	2	0.08	0.08	DN100	DN100
885623	59.102	.2	13388.5436	13388.7436	VCTNC.4R5.X	0	0	180	IE	X-ONE BEA...	1	2	0.08	0.128/0.053	DN100	DN150
885622	63.218	.35	13392.6596	13393.0096	VMCKB.A4R5.X	0	0	180	IE	X-ONE BEA...	1	2	0.128/0.053	0.128/0.053	DN150	DN150
885621	67.484	.35	13396.9256	13397.2756	VAMGD.A4R5.X	0	0	180	IE	X-ONE BEA...	1	2	0.128/0.053	0.128/0.053	DN150	DN150
885620	71.75	.35	13401.1916	13401.5416	VMCKB.B4R5.X	0	0	180	IE	X-ONE BEA...	1	2	0.128/0.053	0.128/0.053	DN150	DN150
885619	76.016	.35	13405.4576	13405.8076	VAMGD.B4R5.X	0	0	180	IE	X-ONE BEA...	1	2	0.128/0.053	0.128/0.053	DN150	DN150
885618	80.282	.35	13409.7236	13410.0736	VMCKB.C4R5.X	0	0	180	IE	X-ONE BEA...	1	2	0.128/0.053	0.128/0.053	DN150	DN150
885617	84.548	.35	13413.9896	13414.3396	VMCKB.D4R5.X	0	0	180	IE	X-ONE BEA...	1	2	0.128/0.053	0.128/0.053	DN150	DN150
885616	84.898	4.102	13414.3396	13418.4416	VCTNB.4R5.X	0	0	0	IE	X-ONE BEA...	1	2	0.128/0.053	0.2127	DN150	DN250
885615	89	.4	13418.4416	13418.8416	VMBGA.A4R5.X	0	0	180	IE	X-ONE BEA...	1	2	0.2127	0.2127	DN250	DN250
885614	89.4	.59	13418.8416	13424.7416	VCDW.A4R5.X	0	0	0	IE	X-ONE BEA...	1	2	0.2127	0.2127	DN250	DN250
885613	95.3	.4	13424.7416	13425.1416	VAMGA.4R5.X	0	0	180	IE	X-ONE BEA...	1	2	0.2127	0.2127	DN250	DN250

LHC database - tooling

- Legend

LEGEND

- Normal field. You can edit it.
- Disabled field. You can't edit it.
- Frozen slot. BUT you CAN modify it.
- Optic slot. You can ONLY move it.
- There is a GAP between two slots.
- There is an OVERLAP between two slots.
- Non-conformity in slot parameters.
- An assembly containing a SECTOR valve.
- + - This is a MASTER slot. Double-click on it to see SLA

HIDE LEGEND

LHC database - tooling

- Slot type view
→ is possible to check and modify the equipment, where it is installed and its characteristics.

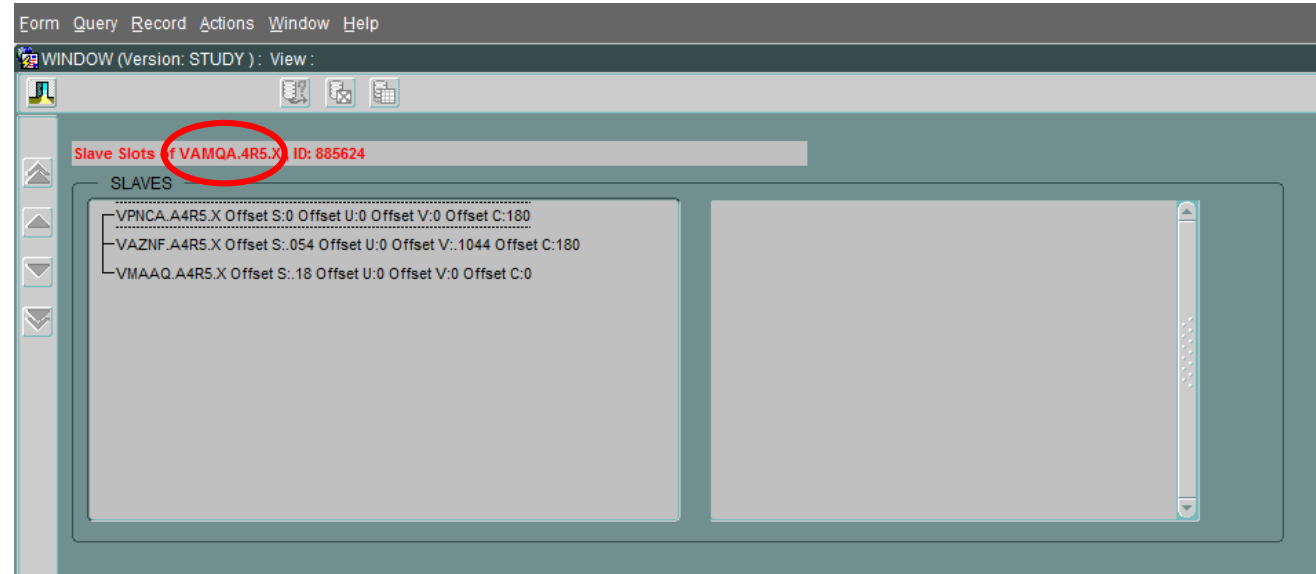
The screenshot displays a software interface for managing slot types in the LHC database. The main window is titled "SLOT TYPES (Version: STUDY) : :". It features a menu bar with "Form", "Query", "Record", "Actions", "Window", and "Help". Below the menu bar is a toolbar with icons for file operations and navigation. The central area contains a table with the following columns: "Subcode", "Seq.Number", "Class", "Name", "Length", "Description", "Status", and "Responsible Pers.". The first row of the table has "VAMQA" in the "Subcode" column, which is circled in red. The second row has "VAMQA180" in the "Name" column. Below the table is a "DUPLICATE SLOT TYPE" button. At the bottom of the interface, there are two tabs: "SLOTS" and "ADDITIONAL PROPERTIES". The "SLOTS" tab is active, showing a table with columns: "Name", "S Start", "S End", "U", "V", "A", "B", "C", "Beam", "Family", and "Status".

Subcode	Seq.Number	Class	Name	Length	Description	Status	Responsible Pers.
VAMQA		VAC-INSTRUM-MODULES	VAMQA	2	Vacuum - Assembly - Module -	DESIGN	ERIC PAGE
VAMQA	180	VAC-INSTRUM-MODULES	VAMQA180	18	Vacuum - Assembly - Module -	DESIGN	ERIC PAGE

Name	S Start	S End	U	V	A	B	C	Beam	Family	Status
VAMQA.4L8.X	23246.0248	23246.2048	0	0	0	0	0	IE	X	INSTALLED
VAMQA.4R8.X	23384.4008	23384.5808	0	0	0	0	180	IE	X	INSTALLED
VAMQA.4L2.X	3263.0824	3263.2624	0	0	0	0	0	IE	X	INSTALLED
VAMQA.4R1.X	57.972	58.152	0	0	0	0	180	IE	X	INSTALLED
VAMQA.4L5.X	13271.2896	13271.4696	0	0	0	0	0	IE	X	INSTALLED
VAMQA.4R2.X	3401.4584	3401.6384	0	0	0	0	180	IE	X	INSTALLED
VAMQA.4L1.X	26600.7312	26600.9112	0	0	0	0	0	IE	X	INSTALLED
VAMQA.4R5.X	13387.4136	13387.5936	0	0	0	0	0	IE	X	INSTALLED

LHC database - tooling

- Read only information about children.



LHC database

- When the tool is complete:
 1. Synchronization to have LHC Non-Official Vacuum Layout.
 2. Synchronization to have LHC Vacuum Layout.

The screenshot shows the 'LAYOUT DATABASE' interface. At the top, there is a navigation bar with links: Functional Positions | Interfaces | Systems | Electrical | Classifications | Machines | Civil Works | More Navigators... A dropdown menu is open, showing a list of reports. The 'Reports' menu is highlighted, and a red box is drawn around 'LHC Non-Official Vacuum Layouts'. Below the menu, there is a search filter table with the following columns and rows:

ID	Function
Name	
Class	
Location	
Longitudinal position [m]:	
Machine	
Responsible	
Naming scheme	
Version	
Search scope	
Output	

At the bottom right of the interface, there is a status bar showing 'LAYOUT DB' and the timestamp '03/06/2016 08:45:16'. There are also 'Search' and 'Reset' buttons at the bottom of the search filter table.

LHC database

- LHC Vacuum layout → excel file and mock up could be automatically generated.

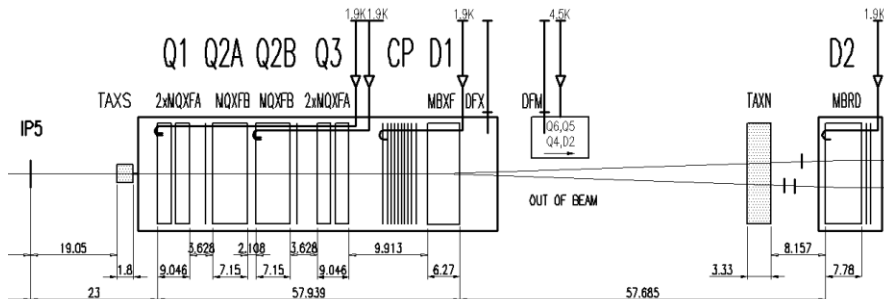
INTE (PVC) CONEXION DE UNIDAD (E/C/E)																										
CDLUM	SUBSECTOR	ID	TYPE ID	FROM MP	LENGTH	S START	S END	NAME	OPTIC NAME	U START	U BEAM START	U END	U BEAM END	V START	V END	A	B	C	BEAM FAMILY	NOTE	PHASE	DATE	STATUS			
36105	VACSEC.PT.L	80724	12043764	3.05	0.00	3.05	4.54	VCLAMP.W.L		0	0	0	0	0	0	0	0	0	100	E	A			INSTALLED		
36203.9712	VACSEC.PT.L	81084	127421	208.00	10.12	1038.8702	1040.0000	LCMP.Z.L1	UPL1	0	0	0	0	0	0	0	0	0	100	E	A			17.06.2015	INSTALLED	
36203.9900	VACSEC.PT.L	81085	126201	208.76	9.95	1040.8900	1040.0000	VCLAMP.L1		0	0	0	0	0	0	0	0	0	100	E	A			17.06.2015	INSTALLED	
36402.2743	VACSEC.PT.L	82268	129102	208.00	1.00	1040.8702	1040.0000	VACSEC.L1		0	0	0	0	0	0	0	0	0	100	E	A				INSTALLED	
36402.5200	VACSEC.ATL.R	27240	271700	208.00	5.3	2640.5200	2640.2200	VCCOR.TL.R		0.007	0.007	0.007	0.007	0	0	0	0	0	100	E	R				INSTALLED	
36408.2700	VACSEC.ATL.R	27242	271680	209.00	6.4	2640.2200	2640.5200	VMAAB.TL.R		0.007	0.007	0.007	0.007	0	0	0	0	0	100	E	R				INSTALLED	
36408.5200	VACSEC.ATL.R	27248	269070	208.76	3.88	2640.5200	2641.4100	VACSEC.L1		0.007	0.007	0.007	0.007	0	0	0	0	0	100	E	R				INSTALLED	
36408.5312	VACSEC.ATL.R	27254	262970	200.302	3.88	2640.5312	2640.5312	VCCDEM.TL.R		0.007	0.007	0.007	0.007	0	0	0	0	0	100	E	R				INSTALLED	
36412.4112	VACSEC.ATL.R	27248	808070	240.400	0.3	26412.4112	26412.7100	VMMG.TL.R		0.007	0.007	0.007	0.007	0	0	0	0	0	100	E	R				INSTALLED	
36412.4172	VACSEC.ATL.R	27248	262070	240.160	4.32	26412.7100	26418.9300	VCCDEN.TL.R		0.007	0.007	0.007	0.007	0	0	0	0	0	100	E	R				INSTALLED	
36412.7200																										
36413.0172																										
36413.4372																										
36413.6372																										
36416.9312	VACSEC.ATL.R	36367	615040	241.940	0.2	26416.9312	26417.1500	VMAAA.TL.R		0.007	0.007	0.007	0.007	0	0	0	0	0	100	E	R				Installed in light screened state	
36417.7312	VACSEC.ATL.R	36368	271700	241.740	4.08	26417.7312	26418.6600	VCCP.L1		0.007	0.007	0.007	0.007	0	0	0	0	0	100	E	R				supported on VPP support	
36417.8060																										
36417.7500																										
36430.7900																										
36430.9900																										
36431.2700																										
36431.6900	VACSEC.ATL.R	27250	615040	237.100	0.2	26431.6900	26431.8900	VMAAA.TL.R		0.007	0.007	0.007	0.007	0	0	0	0	0	100	E	R				Installed in related state	
36431.6900	VACSEC.ATL.R	27250	271610	236.900	3.05	26431.6900	26433.4300	VCCOR.TL.R		0.007	0.007	0.007	0.007	0	0	0	0	0	100	E	R				Installed in related state	
36435.4200	VACSEC.ATL.R	27251	571100	231.400	0.40	26435.4200	26436.9700	VACSEC.L1		0	0	0	0	0	0	0	0	0	100	E	R				INSTALLED	
36436.0712	VACSEC.ATL.R	81080	161000	232.000	0.22	1040.8702	1042.3400	LCMP.L1	UPL1	0	0	0	0	0	0	0	0	0	100	E	R				17.06.2015	INSTALLED
36436.2000	VACSEC.ATL.R	27251	271700	230.270	3.65	26436.2000	26439.8500	VCCOR.L1		0	0	0	0	0	0	0	0	0	100	E	R				INSTALLED	
36436.0612	VACSEC.ATL.R	27258	271700	232.824	7	26436.0612	26441.6500	VCCOR.L1		0.007	0.007	0.007	0.007	0	0	0	0	0	100	E	R				INSTALLED	
36436.5212																										
36440.0012																										
36440.5212																										
36441.9000	VACSEC.ATL.R	27258	271640	218.924	0.3	26441.9000	26442.2900	VMAAB.L1		0.007	0.007	0.007	0.007	0	0	0	0	0	100	E	R				INSTALLED	
36442.0000																										
36442.2500	VACSEC.ATL.R	27259	271700	218.824	7	26442.2500	26449.2900	VCCOR.L1		0.007	0.007	0.007	0.007	0	0	0	0	0	100	E	R				INSTALLED	
36449.2500	VACSEC.ATL.R	27259	272040	209.824	0.3	26449.2500	26449.5900	VMAAB.L1		0.007	0.007	0.007	0.007	0	0	0	0	0	100	E	R				INSTALLED	
36449.5500	VACSEC.ATL.R	27264	271700	209.324	7	26449.5500	26449.5900	VCCOR.L1		0.007	0.007	0.007	0.007	0	0	0	0	0	100	E	R				INSTALLED	
36449.5512	VACSEC.ATL.R	27264	271640	209.324	0.3	26449.5500	26449.8900	VMAAB.L1		0.007	0.007	0.007	0.007	0	0	0	0	0	100	E	R				INSTALLED	

OUTER PIPE [E]																										
SUBSECTOR	ID	TYPE ID	FROM MP	LENGTH	S START	S END	NAME	OPTIC NAME	U START	U BEAM START	U END	U BEAM END	V START	V END	A	B	C	BEAM FAMILY	NOTE	PHASE	DATE	STATUS				
VACSEC.ATL.R	27258	271700	209.954	5.3	2642.9200	26408.2200	VCCOR.TL.R		-0.007	-0.007	-0.007	-0.007	0	0	0	0	0	0	100	E	R				INSTALLED	
VACSEC.ATL.R	27241	673083	250.854	0.302	26408.2200	26408.5312	VMAAB.TL.R		-0.007	-0.007	-0.007	-0.007	0	0	0	0	0	0	100	E	R				INSTALLED	
VACSEC.ATL.R	27254	262970	200.302	3.88	26408.5312	26412.4172	VCCDEM.TL.R		-0.007	-0.007	-0.007	-0.007	0	0	0	0	0	0	100	E	R				INSTALLED	
VACSEC.ATL.R	27245	676007	240.400	0.303	26412.4172	26412.7200	VMMG.TL.R		-0.007	-0.007	-0.007	-0.007	0	0	0	0	0	0	100	E	R				INSTALLED	
VACSEC.ATL.R	27247	670481	240.163	0.297	26412.7200	26413.0172	VCCOR.L1		-0.007	-0.007	-0.007	-0.007	0	0	0	0	0	0	100	E	R				INSTALLED	
VACSEC.ATL.R	27247	670481	240.163	0.42	26413.0172	26413.4372	VCCOR.L1		-0.007	-0.007	-0.007	-0.007	0	0	0	0	0	0	100	E	R				INSTALLED	
VACSEC.ATL.R	363714	615040	240.440	0.2	26413.4372	26413.6372	VMAAA.TL.R		-0.007	-0.007	-0.007	-0.007	0	0	0	0	0	0	100	E	R				INSTALLED	
VACSEC.ATL.R	676655	263120	240.340	3.918	26413.6372	26417.6500	VCCOR.L1		-0.007	-0.007	-0.007	-0.007	0	0	0	0	0	0	100	E	R				INSTALLED	
VACSEC.ATL.R	363716	615040	241.520	0.2	26417.6500	26417.7500	VMAAA.TL.R		-0.007	-0.007	-0.007	-0.007	0	0	0	0	0	0	100	E	R				INSTALLED	
VACSEC.ATL.R	363716	271700	241.120	3.030	26417.7500	26420.7900	VCCOR.L1		-0.007	-0.007	-0.007	-0.007	0	0	0	0	0	0	100	E	R				INSTALLED	
VACSEC.ATL.R	363717	615040	240.930	0.2	26420.7900	26420.9900	VMAAA.TL.R		-0.007	-0.007	-0.007	-0.007	0	0	0	0	0	0	100	E	R				INSTALLED	
VACSEC.ATL.R	62676	102619	237.000	0.205	10420.9900	10421.2700	UPMASK.TL.R		-0.007	-0.007	-0.007	-0.007	0	0	0	0	0	0	100	E	R				17.01.2016	INSTALLED
VACSEC.ATL.R	62676	62676	237.000	0.42	10421.2700	10421.6900	VCCOR.L1		-0.007	-0.007	-0.007	-0.007	0	0	0	0	0	0	100	E	R				16.11.2016	INSTALLED
VACSEC.ATL.R	27249	615040	237.100	0.2	26421.6900	26421.8900	VMAAA.TL.R		-0.007	-0.007	-0.007	-0.007	0	0	0	0	0	0	100	E	R				INSTALLED	
VACSEC.ATL.R	27251	271610	236.900	3.030	26421.8900	26429.5900	VCCOR.L1		-0.007	-0.007	-0.007	-0.007	0	0	0	0	0	0	100	E	R				INSTALLED	
VACSEC.ATL.R	27251	271610	236.900	3.030	26421.8900	26429.5900	VCCOR.L1		-0.007	-0.007	-0.007	-0.007	0	0	0	0	0	0	100	E	R				INSTALLED	
VACSEC.ATL.R	27251	571100	231.400	0.40	26429.5900	26436.9700	VACSEC.L1		-0.007	-0.007	-0.007	-0.007	0	0	0	0	0	0	100	E	R				INSTALLED	
VACSEC.ATL																										

Hi-Lumi Vacuum layout between D1 and D2

Hi-Lumi Vacuum layout between D1 and D2

- Inputs:
 - HL-LHC Long straight sections Right of Point 5 (LHCLSXH_0013)*
 - Courtesy of Blanca Vazquez de Prada
 - Layout of HL-LHC insertions IR5 (LHCLSXGH_0007-v0)
 - TCTPV mock-up (ST0735828)
 - Courtesy of Nicolas Joannon
 - Aperture and distance between beams**
 - Courtesy of Riccardo De Maria (21/04/2016)
 - Double beam collimators (TCTPH and TCLX)



Element	S [m] - magnetic length	Separation [mm]	Aperture [mm]
End D1 (MBXF)	80.939	0	119
Start TAXN	127.135	148	85
End TAXN	130.467	158	85
outside D2 (MBRD)	137.624	180	85
Start D2 (MBRD)	138.624	188	87
End D2 (MCBRD)	146.404	188	87
Start Q4 (MCBYY)	175.685	194	72.41
End Q4 (MQYY)	179.515	194	72.41
Start Q5 (MQY)	205.79	194	57.8
End Q5 (MCBY)	209.19	194	57.8
Start Q6	225.99	194	45.1
End Q6	230.79	194	45.1
Start Q7	260.004	194	44
End Q7	267.171	194	44

*From END Q4 to the right not symmetric any more Left/Right 1/5

*In work

**Beam separation and beam aperture are not definitive

Draft Hi-Lumi Vacuum layout



Draft Hi-Lumi Vacuum layout

- Information to be completed in the excel file:
 - DCUM → equipment number
 - Vacuum subsector
 - SLOT_ID → position in the ring
 - SLOT_TYPE ID → component name
 - Distance FROM_IP
 - Equipment LENGTH
 - S_START
 - S_END
 - Equipment NAME
 - VAC/OPTIC NAME
 - TSEL_NAME
 - BEAM APERTURE START
 - BEAM APERTURE END
 - BEAM → interior, exterior or both beams
 - FAMILY → beam 1, beam 2 or both beams
 - PHASE
 - DATE
 - Position and orientation equipment:
 - U_START
 - U_END
 - U_BEAM_START
 - U_BEAM_END
 - V_START
 - V_END
 - A → rotation in beam axis
 - B → rotation in U
 - C → rotation in V
 - SHAPE START → inner chamber shape
 - SHAPE END → inner chamber shape
 - INNER DIAMETER START → inner chamber diameter
 - INNER DIAMETER END → inner chamber diameter
 - FLANGE START → DN chamber flange
 - FLANGE END → DN chamber flange
 - STATUS

Underline fields are new, compared to LHC database

Draft Hi-Lumi Vacuum layout

Following the vacuum layout proposed before, the excel file is completed:

- Optical layout given by database manager.
- Inner pipe, common or unique (I,IE,C,X):
→ To be checked.

TASX R5

#	#-CH	SUBSECTOR	START_ID	START_TYPC	FROM_ID	LCRCTR	L_START	L_CER	NAME	MOVCH FROM	VACUICITY	TYPE	SEC SECTARY	DCOH.APERTURE	R_STA	R_END	R_START	R_CER	R_START	T_CER	A	B	C	DCOH	FAMILY	DATE	PRAC	RAY	SRAPC	SRAPC	Inner	Inner	START	START	STATUS		
			ID							LABOUR				EBD	ST														Level	Level							
142	13304-010		03	E-10	13304-010	13304-022					TASX-R5				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
143	13304-010	VACCEC-AMS-R																																			
144	13304-010	VACCEC-AMS-R																																			
145	13304-010	VACCEC-AMS-R																																			
146	13304-010	VACCEC-AMS-R																																			
147	13304-010	VACCEC-AMS-R																																			
148	13304-010	VACCEC-AMS-R																																			
149	13304-010	VACCEC-AMS-R																																			
150	13304-010	VACCEC-AMS-R																																			
151	13304-010	VACCEC-AMS-R																																			
152	13304-010	VACCEC-AMS-R																																			
153	13304-010	VACCEC-AMS-R																																			
154	13304-010	VACCEC-AMS-R																																			
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177	13304-010	VACCEC-AMS-R																																			
178	13304-010	VACCEC-AMS-R																																			
179	13304-010	VACCEC-AMS-R																																			
180	13304-010	VACCEC-AMS-R																																			

D2 R5

Draft Hi-Lumi Vacuum layout

- Should Hi-Lumi DB be included inside LHC DB?
 - Is important to have different equipment names for equipment installed in LHC and in Hi-Lumi.
 - from this point of view Hi-Lumi database should be included in LHC database.
- When should be done the tooling?
 - ASAP → to generate excel file, aperture table and mock-up automatically and avoid mistakes.
- Is required more information inside the DB?
 - Components material.

CONCLUSIONS

- Tool allow automatic generate a excel file and mock up.
- Hi-Lumi layout between D1 and D2 LSS R5:
 - TCTPH and TCLX double beam collimator.
 - VCTY inside TAXN.
 - Quick flanges everywhere between D1 and D2 except connections between:
 - DFJX-VAB → to be defined by project.
 - Left TAXN → to be checked feasibility.
 - Right TAXN (to avoid staggered flanges).
 - VAB-D2 → to be defined by project.
- Draft Hi-Lumi layout to be discuss:
 - Similar to LHC database.
 - Should be Hi-Lumi database included inside LHC database?
 - Yes, to have different names in both databases.
 - Is required more information?
 - components material
 - When should be done the tooling?
 - ASAP. To generate excel file and mock up automatically.

NEXT STEP(S)

- Define Hi-Lumi database.
- Define which information need to be included in the database.
- Define tooling database.
- Complete database between D2 and Q7.



***THANK YOU FOR YOUR
ATTENTION!!!***

