Temperature follow up in LSS3 and LSS7

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context

C. Rathjen project

Collimation Working group 93th fevrier 2008

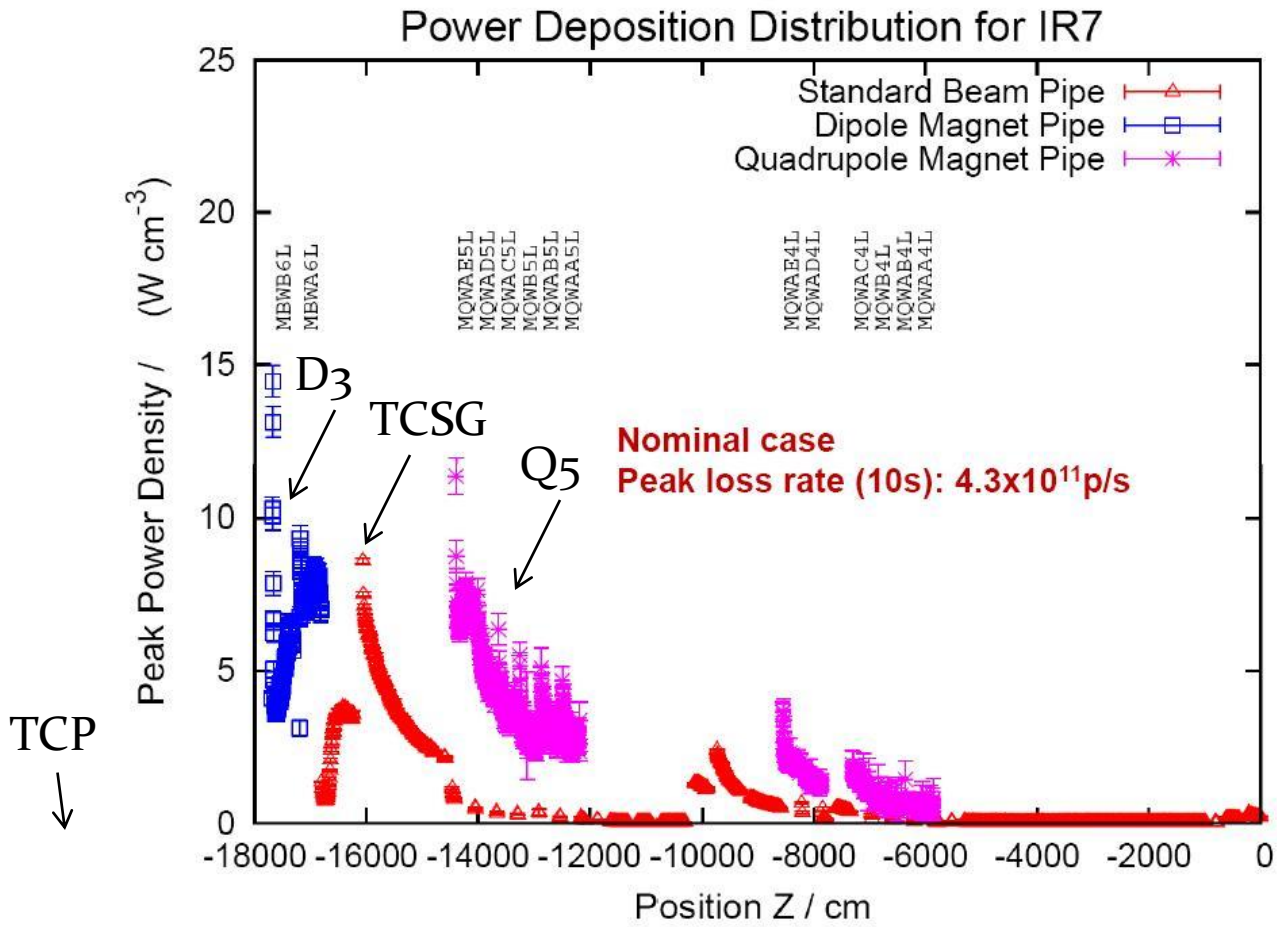
M. Brugger : fluka simulation (slide 3 and 4)

Meeting V. Baglin, O. Andujar, R. Assmann, S. Redaelli

Draft presentation for new input and validation

Fluka Simulation

Peak Values along the Beamline

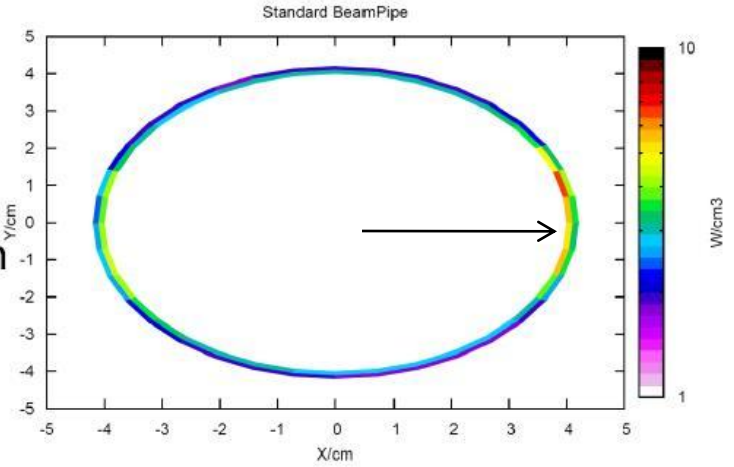


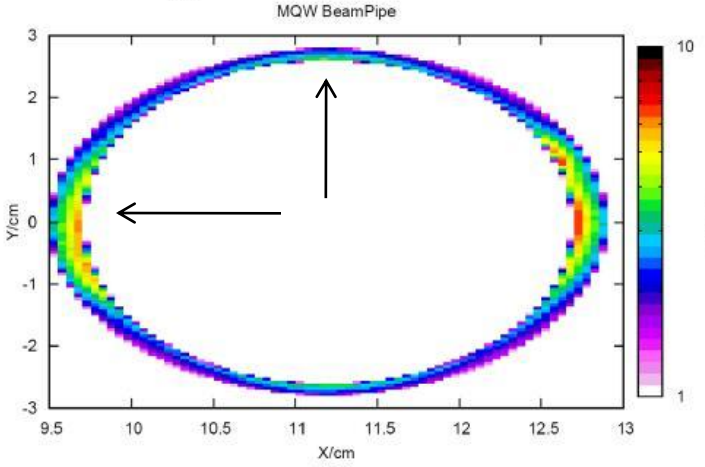
Fluka simulation

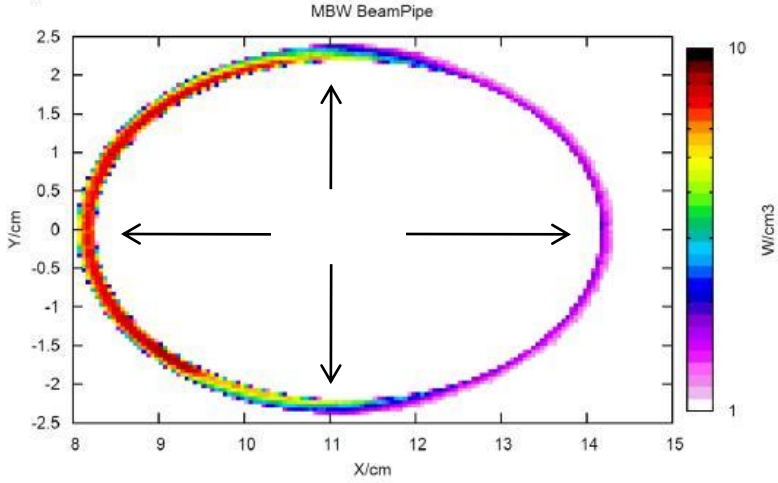
Technicalities

Nominal case
Peak loss rate (10s): 4.3×10^{11}p/s

- Special scoring for each type of beam pipe as implemented along the full IR7 FLUKA geometry
- FLUKA calculates peak energy densities (GeV/cm^3), then to be converted into W/cm^3 assuming a given loss rate (in our case the peak rate of 4.3×10^{11}p/s)
- A routine then allows us to extract respective longitudinal maxima (as well as average and total – not shown here)

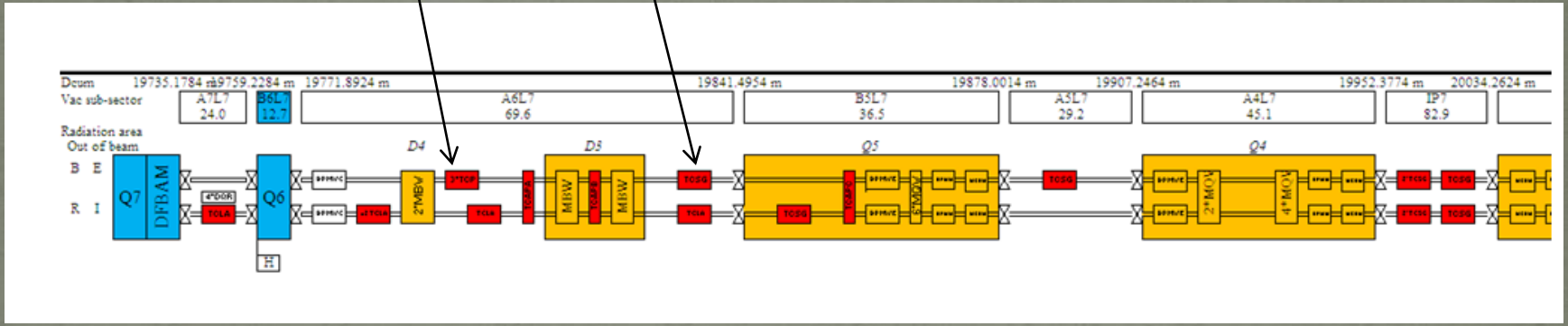




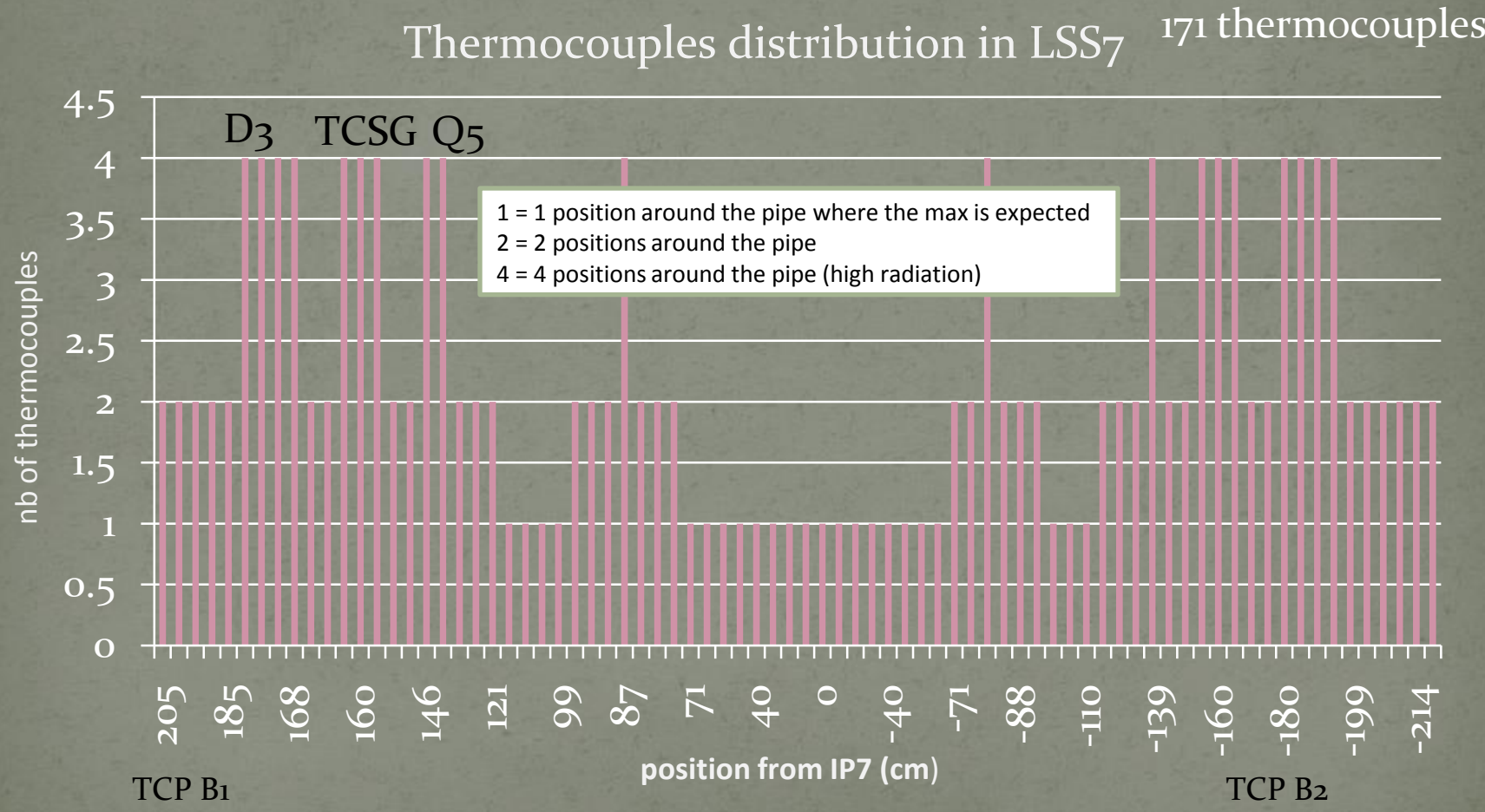


Layout LSS7L

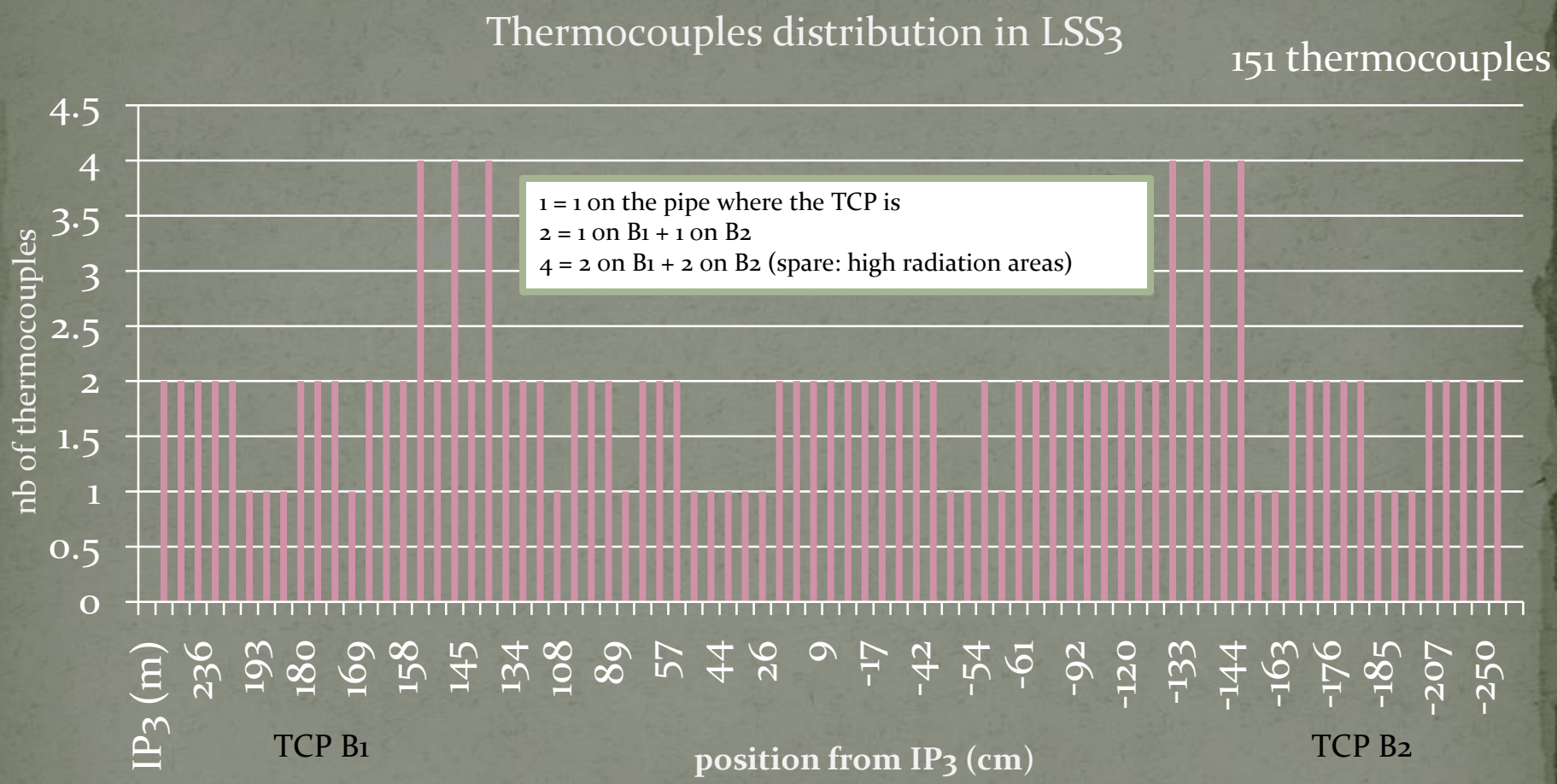
TCP.B1 TCSG.B1



LSS7 implementation



LSS3 implementation



Naming convention

Vacuum instrumentation:
LHCVIE - Vacuum Instrumentation thermocouple type E
LHCVIES – Vac. Instr. Th.type E - Standart

Position:
Name for longitudinal position (ex: A6R7, B6R7 etc)
Name for position on pipe (U et V)

Implementation table (draft)

	Boite: #-IP1(mm)	# thermo	nbr de thermo	position orbitale	position critique	IP7 (m)	IP1 (mm)	Nom equip	BLM	chambre
IP7 Left	#7 - 19999	1	1	int		0	19999	VCDTG.A4R7	BLMES.C4R7	
		2	1	int		10	19989	VCDSS.B4L7	BLMES.D4L7	
		3	1	int		17	19982	VCDTG.4L7	BLMES.F4L7	
		4	1	int		30	19969	VCDA.A4L7		
		5	1	int		40	19959	VCDA.C4L7		
		6	1	int		50	19949	VCDBK.4L7	BLMES.G4L7	
Q4	#6 - 19944	7	1	int		64	19935	BPMW.4L7.B1		quadrupole
		8	1	int		67	19932	VCELQ.A4L7		
		9	1	int		71	19928	VCELQ.B4L7		
		10	2	int, up		75	19924	VMGIB.4L7		
		11	2	int, up		79	19920	VCELQ.D4L7	BLMEI.O4L7	
		12	2	int, up		83	19916	VCDSS.D4L7		
		13	4	int,up,ext,do		87	19912	VAMGE.B4L7		
TCS	#5 - 19889	14	2	ext, up		92	19907	BPMWE.4L7		standard
		15	2	int, up		94	19905	VCDTX.5L7	BLMEI.A5L7	
		16	2	ext, up		97	19902	VAMLB.A5L7	BLMEI.B5L7	
		17	1	ext		99	19900	VCDTG.A5L7	BLMEI.C5L7	
		18	1	ext		103	19896	TCSG.A5L7	BLMEI.F5L7	
		19	1	ext		113	19886	VAZAE.A5L7	BLMEI.J5L7	
		20	1	ext		117	19882	VAMLB.B5L7	BLMEI.L5L7	
Q5	#4 - 19889	21	2	int, up		121	19878	VCDTV.5L7	BLMEI.N5L7	quadrupole
		22	2	int, up		130	19869	VCELQ.A5L7		
		23	2	int, up		138	19861	VCELQ.D5L7		
		24	4	int, up, ext, do		142	19857	VCELQ.D5L7		
		25	4	int, up, ext, do		146	19853	VCELQ.F5L7		
TCSGa	#3 - 19809	26	2	ext, up		150	19849	BPMWE.5L7		standard
		27	2	ext, up		155	19844	VAZAE.A6L7	BLMEI.B6L7	
		28	4	int, ext,up, do		158	19841	VAZAF.B6L7		
		29	4	int, ext,up, do		160	19839	VCDSW.6L7	BLMEI.C6L7	
TCSGb	#2 - 19809	30	4	int, ext,up, do		162	19837	VCDSW.6L7		standard
		31	2	ext, up		164	19835	VAMTA.A6L7	BLMEI.D6L7	
		32	2	ext, up		166	19833	VAMTA.B6L7	BLMEI.E6L7	
		33	4	int, ext,up, do		168	19831	VAMTA.C6L7	BLMEI.F6L7	
D3	#1 - 19809	34	4	int, ext,up, do		173	19826	VMHSB.6L7		dipole
		35	4	int, ext,up, do		177	19822	VCELW.A6L7	BLMEI.H6L7	
		36	4	int, ext,up, do		182	19817	VCELW.B6L7	BLMEI.I6L7	
TCP	#0 - 19809	37	2	up B1; upB2		185	19814	VCDTM.6L7; VCDTL.6L7		standard?
		38	2	int B1; int B2		191	19808	VCDSO.6L7; TCLA.B6L7	BLMEI.J6L7	
		39	2	do B1; do B2		197	19802	VAMLD.6L7:VAMLB.C6L7		
		40	2	ext B1; ext B2		200	19799	VAMTA.F6L7; VAMLD.6L7	BLMEI.K6L7	
		41	2	up B1; upB2		205	19794	VAMTA.J6L7;VCDTG.B6L7	BLMEI.O6L7	

Conclusion

Distribution in LSS7 and LSS3 is slightly different

LSS7 follows peak density values and pipe's non homogeneities

LSS3 compares pipes of beam 1 and beam 2

Comparison with losses could be done where the BLM is at the same place than the thermocouple

Number of thermocouples will be approximately 300 for the 2 LSS

Waiting for feedback to finish the implementation in the data base

Status: implementation of thermocouples patch panel and pulling of thermocouples cables

Publication of the temperature will be available on PVSS and on CMW

Questions ?

Suggestions ?