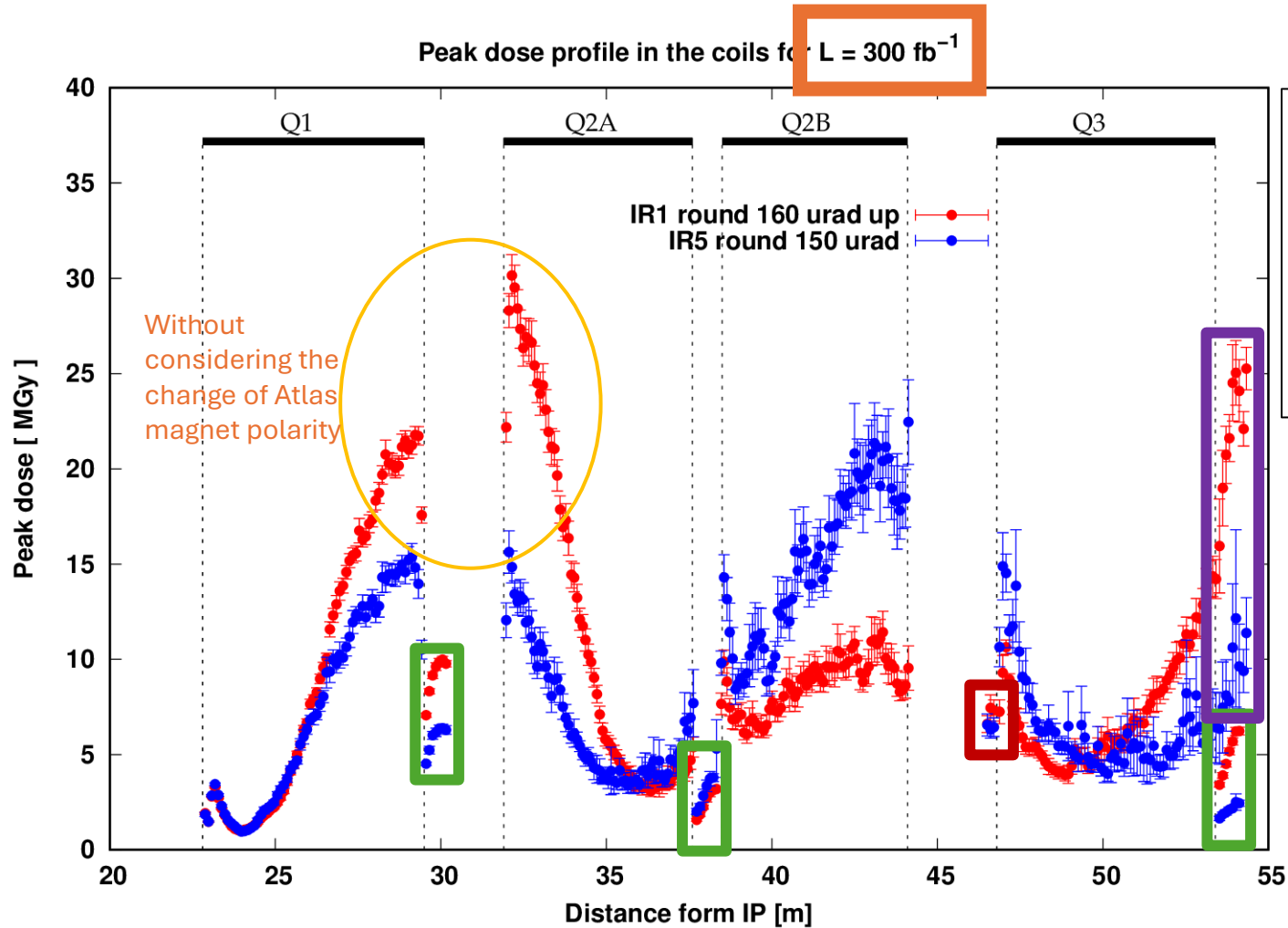


Tentative selection of IT cryomagnets to keep as spare magnets

- Selection done considering
 - Known non-conformities on main magnets and corrector magnets
 - LS2 powering performance test
 - Maximum local dose taken during Run 1, Run 2 and objective of Run 3
 - On main magnets
 - On corrector magnets

Polarity : FDF = configuration Run1, Run2 and beginning of Run 3



correctors:

MCBX: larger aperture

MQSX: coils off mid planes

MC S/T X & MC O/OS/SS X

Insulation degradation may appear (to be confirmed)

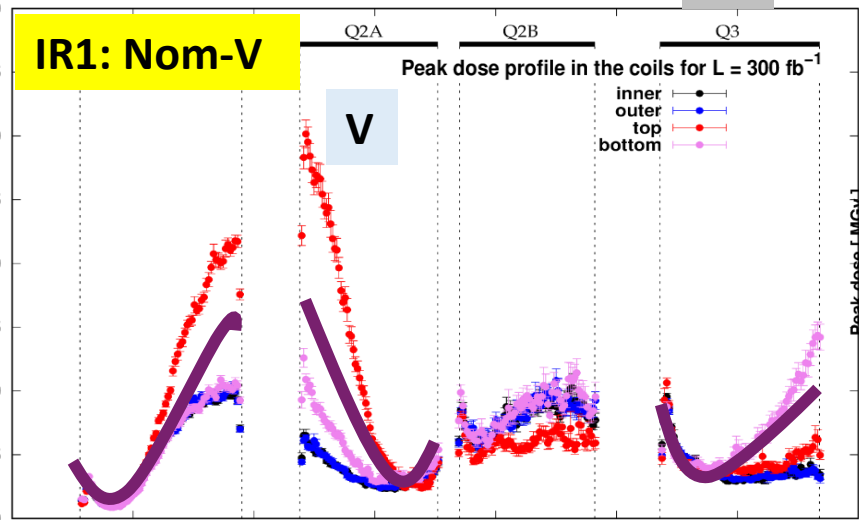
- Above 30 MGy for main magnets
- Above 7 MGy for corrector magnets

Q2 IR1 : Nom – V up to 2023; RP- V up to 2024 ; → Nom – H

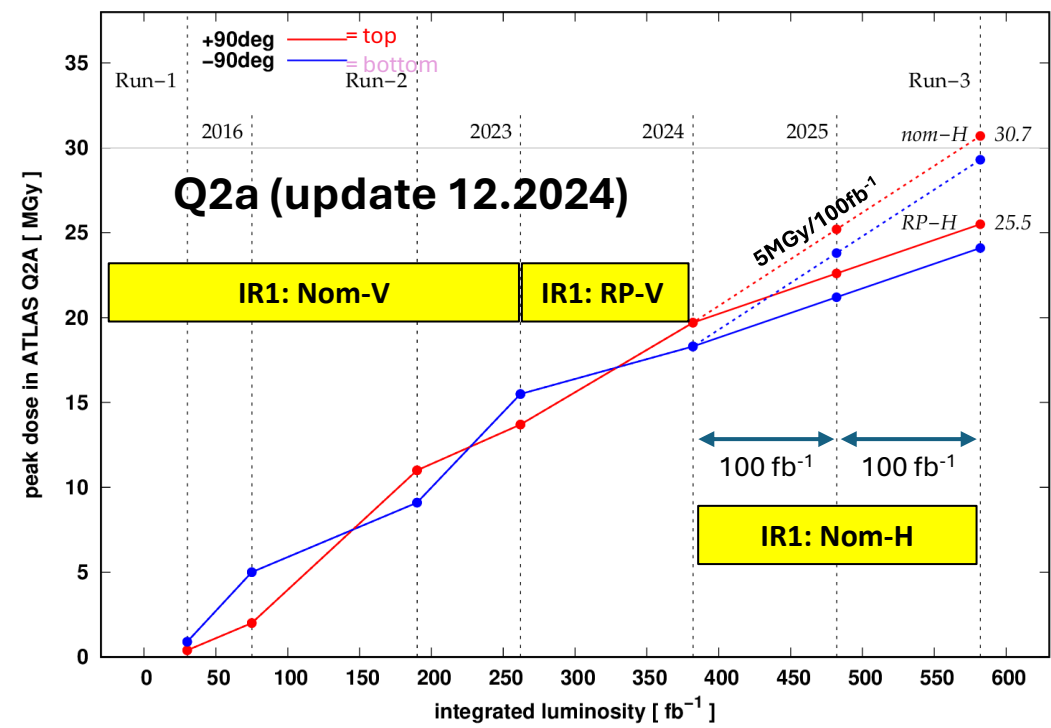
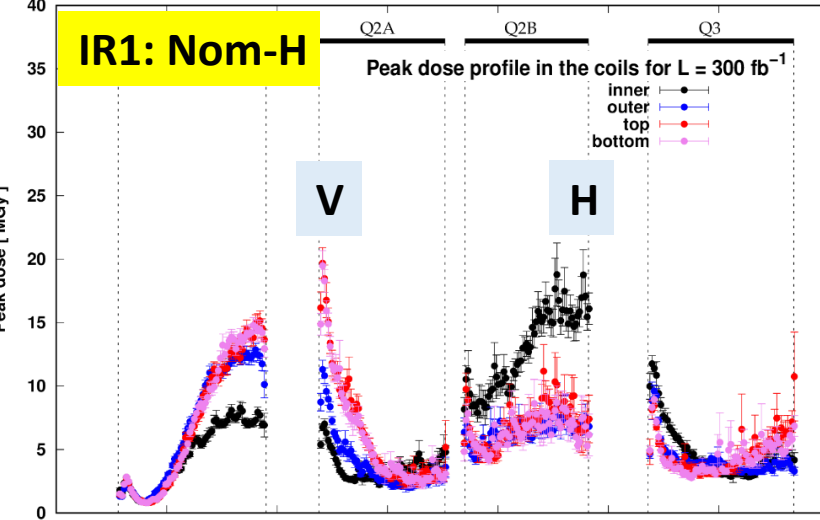
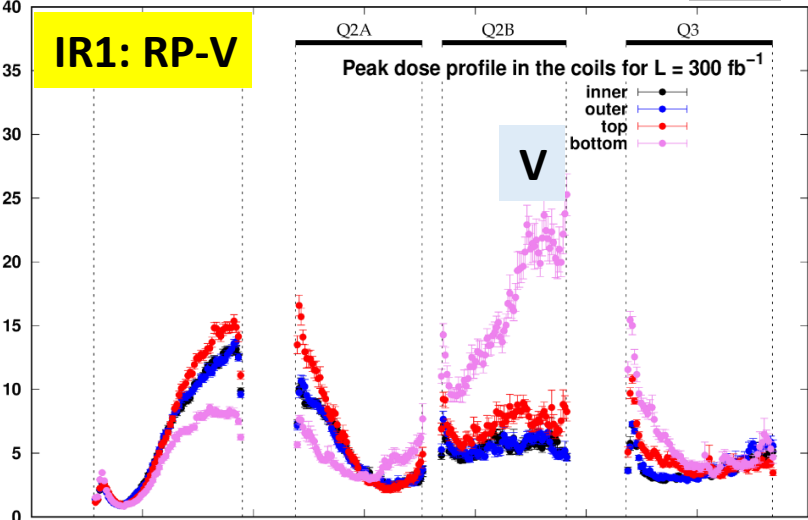
0 < L < 260 fb⁻¹ **87%**

260 fb⁻¹ < L < 380 **40%**

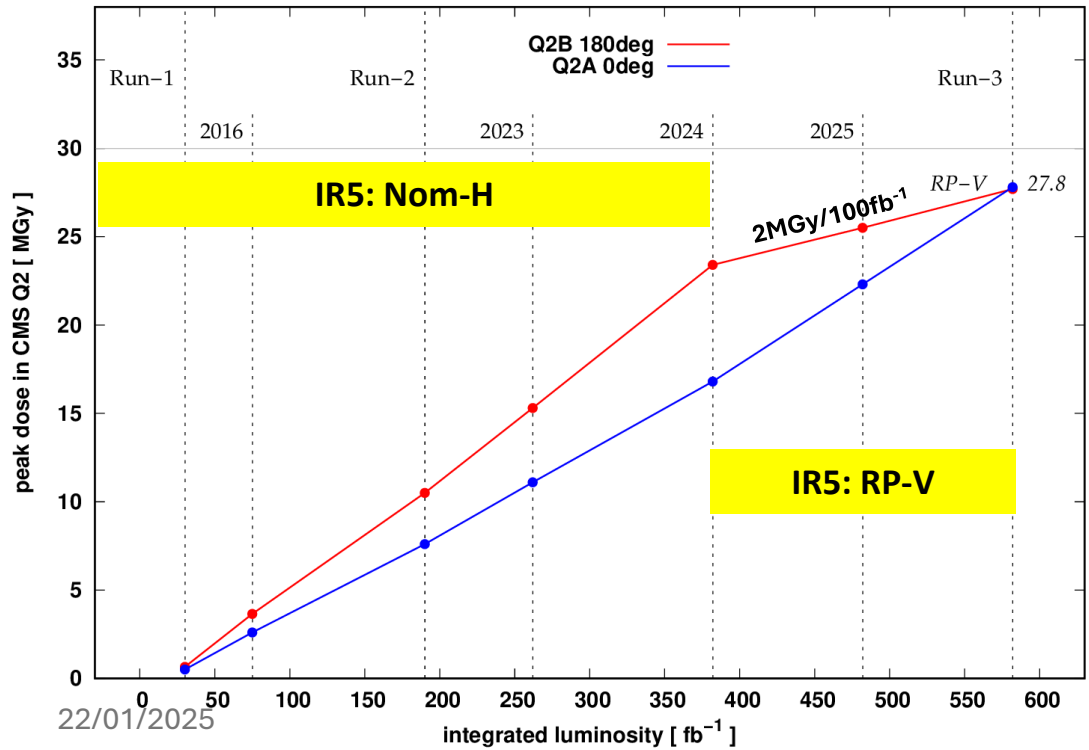
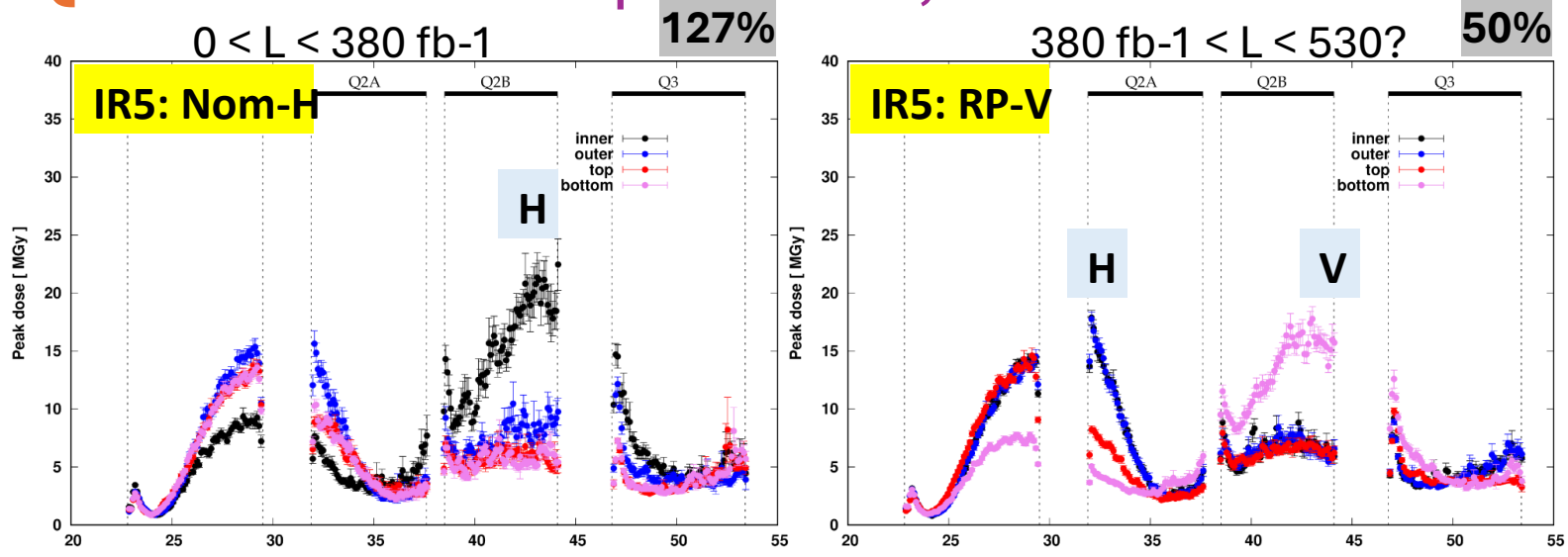
380 fb⁻¹ < L < 530? **50%**



Cham2024



Q2 IR5 : Nom – H up to 2024; → RP - V

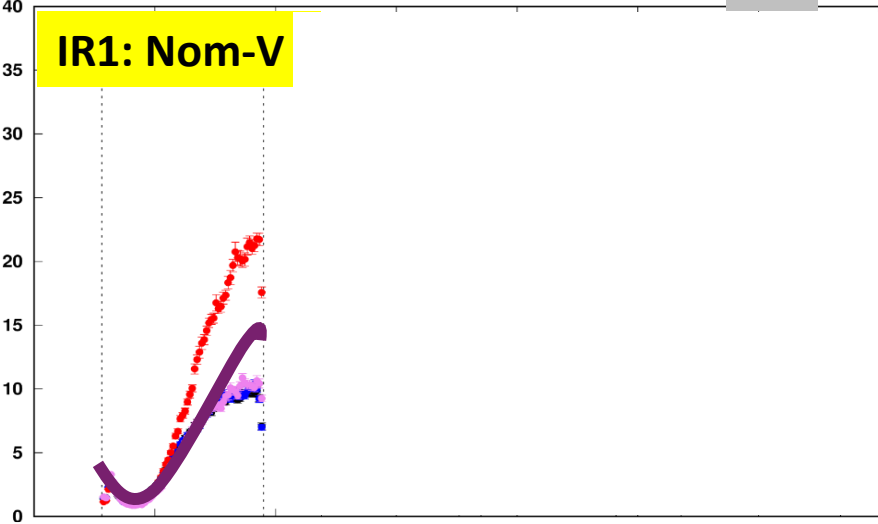


For Q1 in IR1 and IR5

0 < L < 260 fb-1

87%

IR1: Nom-V



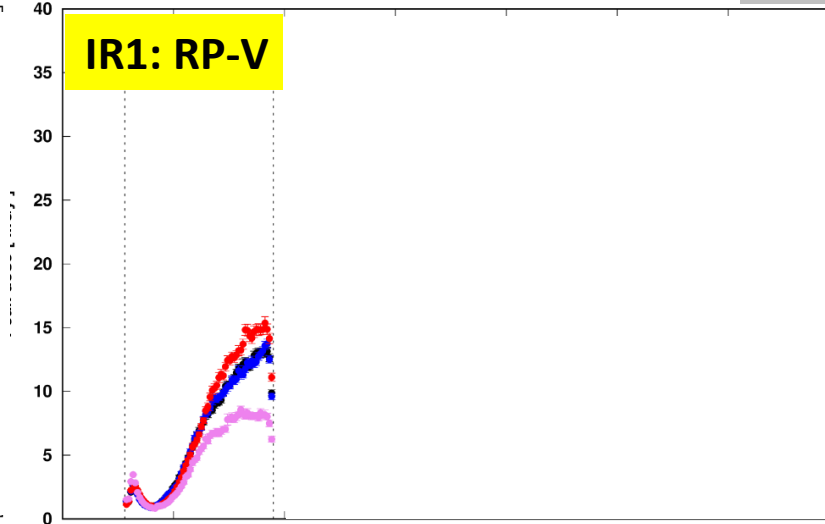
Q1 ~ 15 * 530 / 300 = 26.5 MGy

Idem pour IR5

260 fb-1 < L < 380

40%

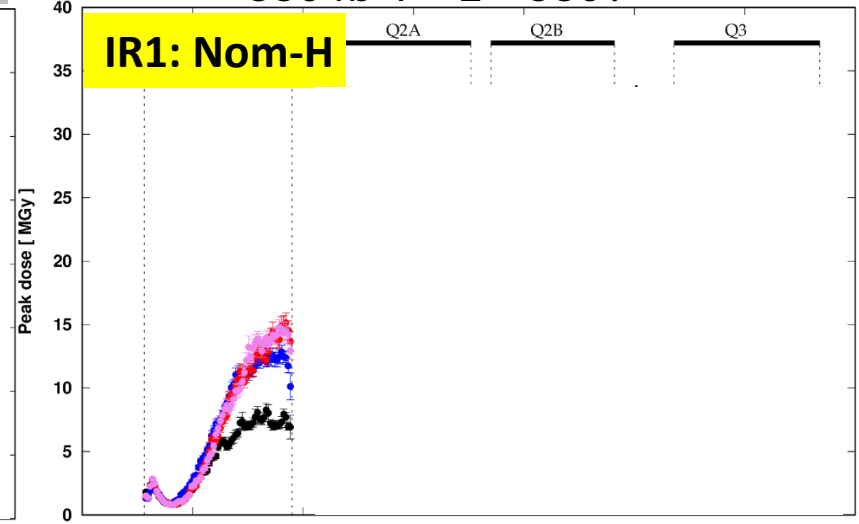
IR1: RP-V



380 fb-1 < L < 530?

50%

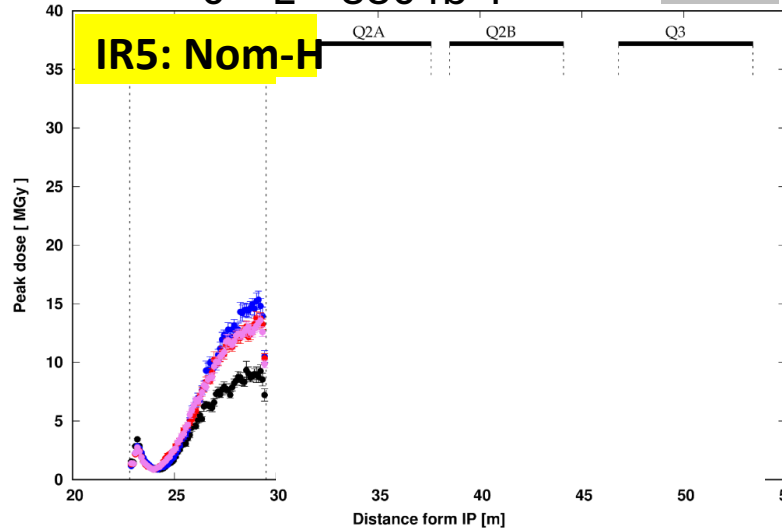
IR1: Nom-H



0 < L < 380 fb-1

127%

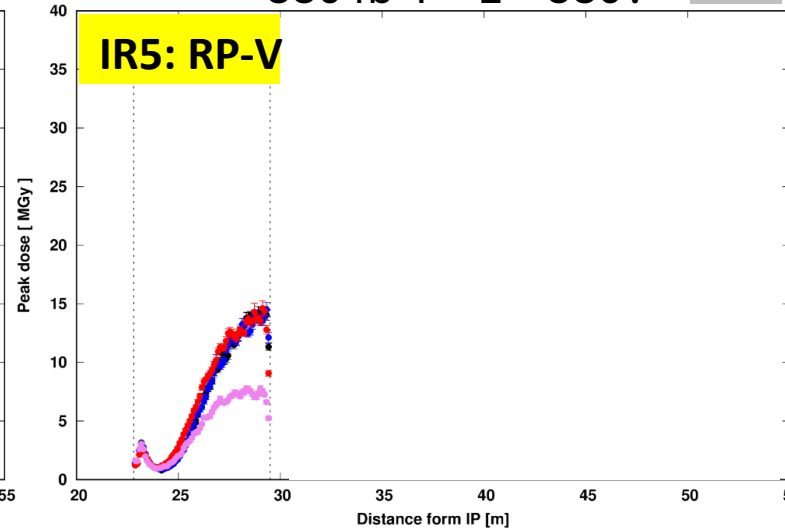
IR5: Nom-H



380 fb-1 < L < 530?

50%

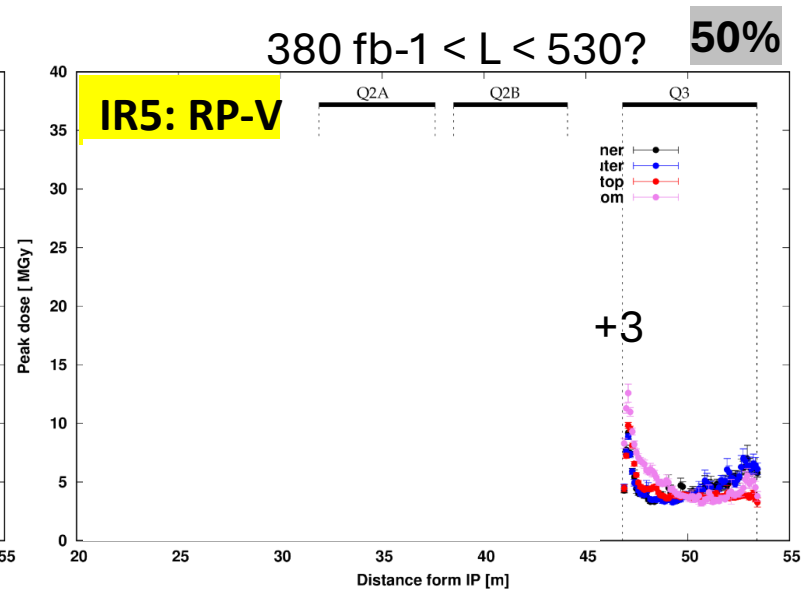
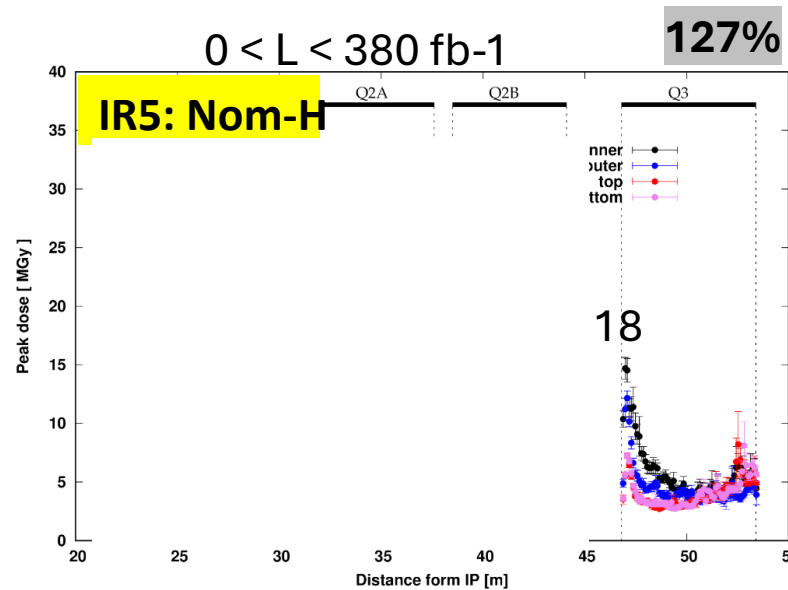
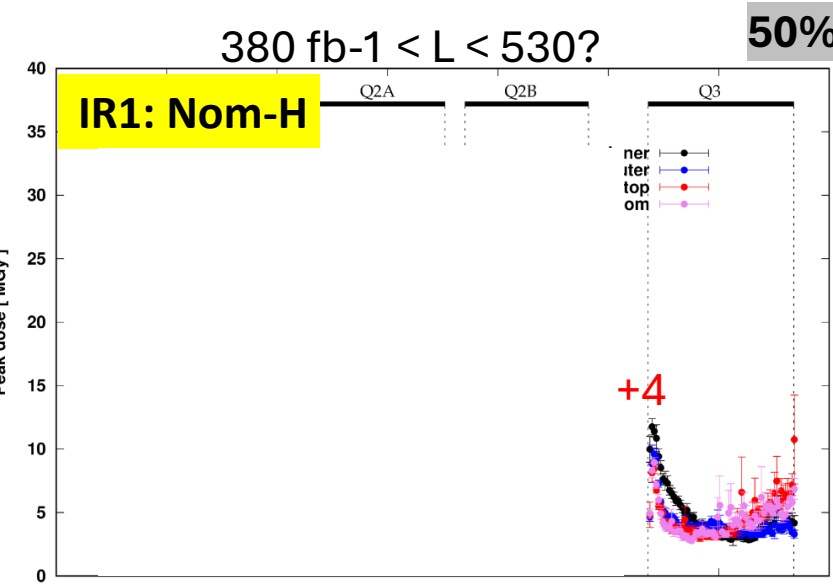
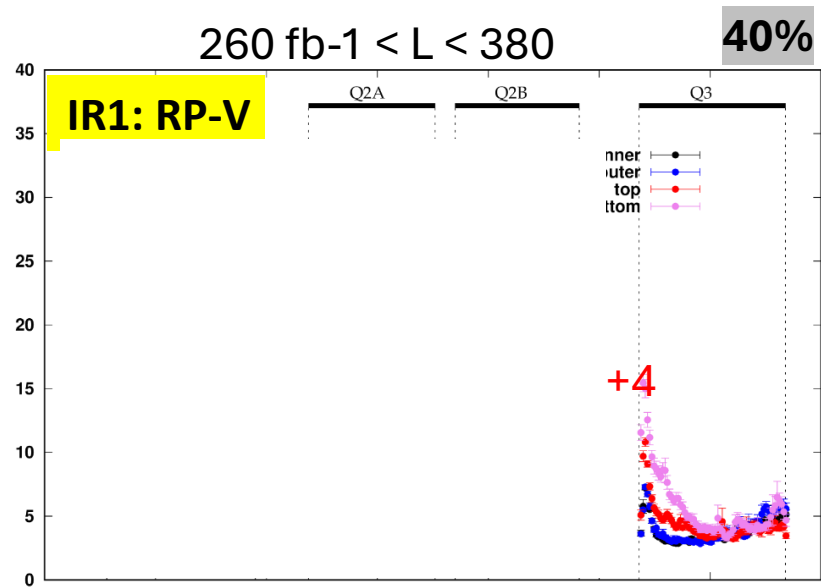
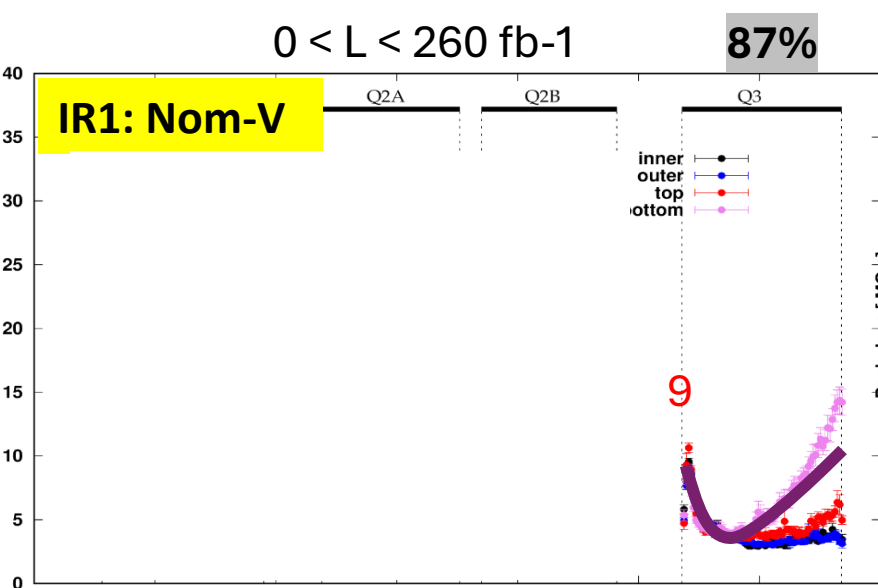
IR5: RP-V



Mail de F. Cerutti:

Pour les quatre **Q1 (P1 et P5)**, dans l'hypothèse 580 fb-1 (c'est-à-dire 200 fb-1 sur 2025+2026) on va arriver sur les **25 MGy**.

For Q3 in IR1 and IR5



Mail de F. Cerutti:
 Niveau main quadrupoles, les aimants moins impactés sont les **deux Q3 d'ATLAS (Point 1)** qui selon les calculs toucheront **15 MGy** après 580 fb-1
 Puis il y a les **deux Q3 de CMS (P5)**, qui passeront à peine les **20 MGy** après les mêmes 580 fb-1.

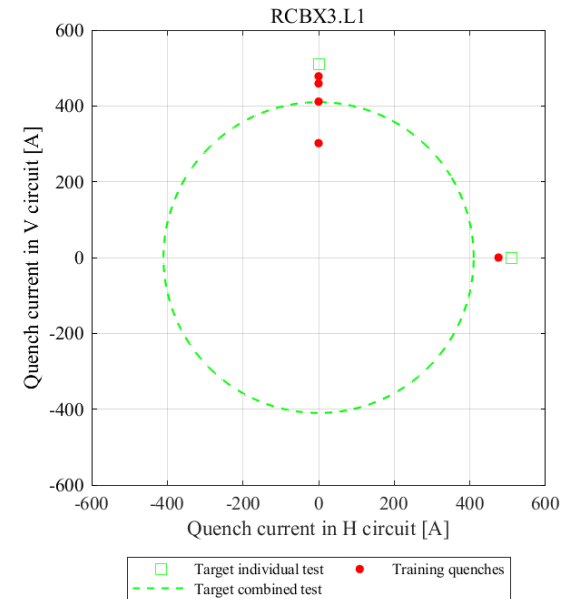
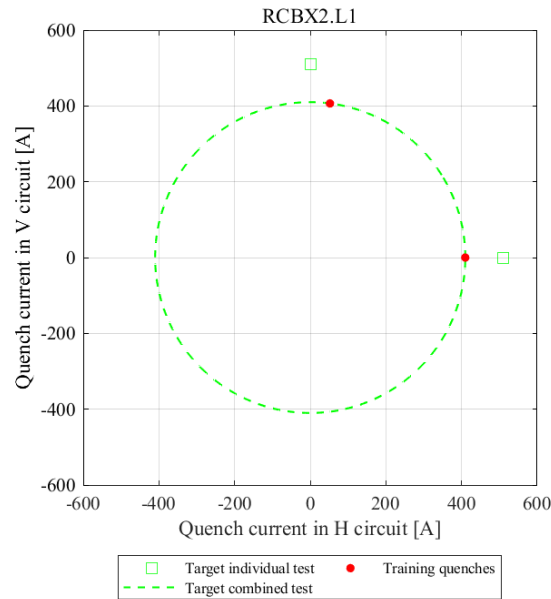
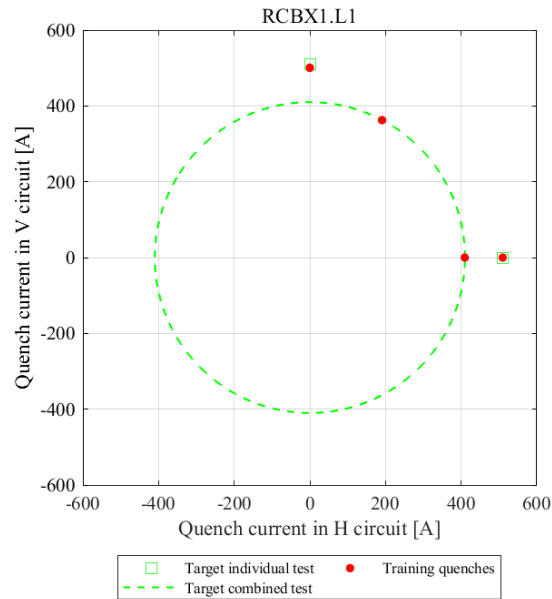
Known non-conformity on IT magnets

QH issue on Q1.R1 : [1017174](#) One of the two quench heater circuits (YT1121) breaks down above 1000V → Power supply of the QHC reduced to 800V

Weakness on MCBX combined magnets : <https://edms.cern.ch/document/1395638> (see LMC#183)

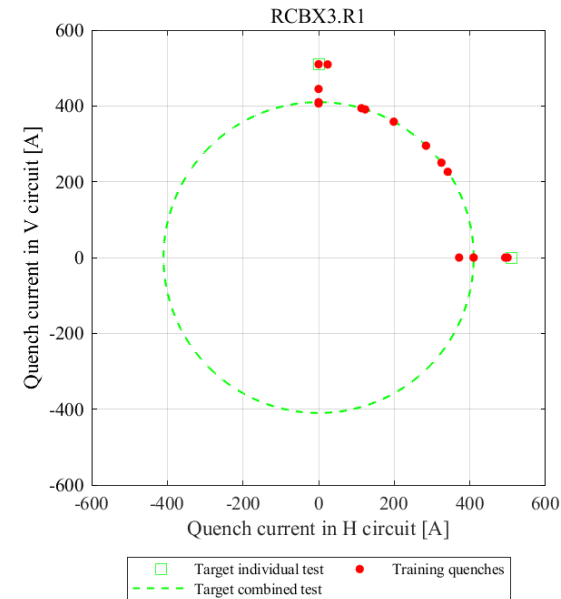
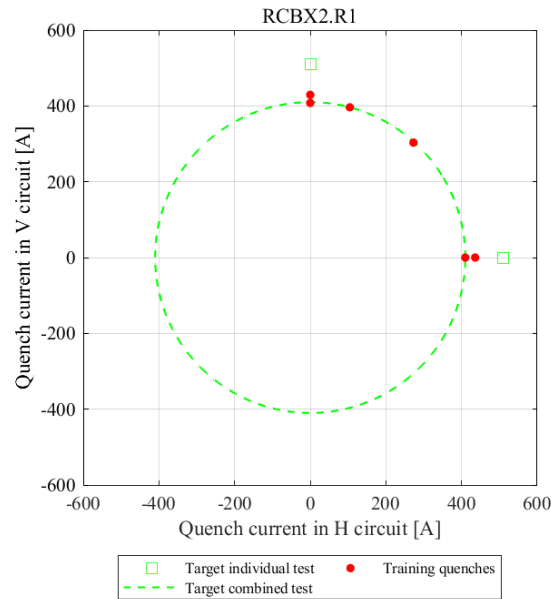
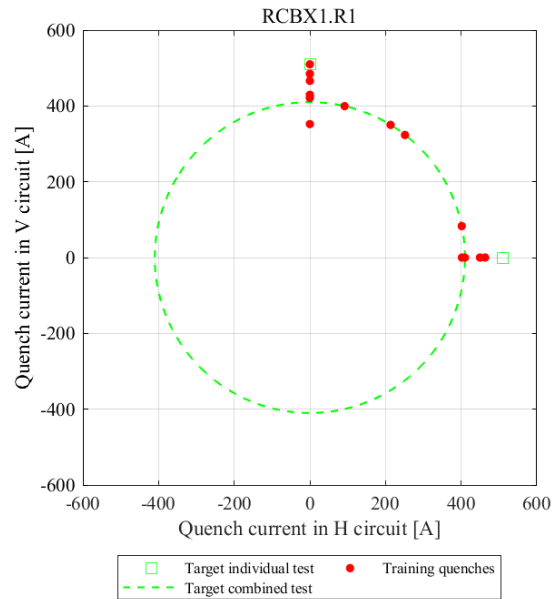
LAYOUT INFORMATION			ACCEPTANCE TEST DATA				LHC POWERING			
LAYOUT NAME	Equipment name	Magnet Type	Individual Powering		Combined Powering	REMARKS	Individual Powering		Combined Powering	
			MCBXV	MCBXH	Geom. Sum of H & V		With MCSTX @ 100 A	MCBXV	MCBXH	H & V Current in Diag.
MCBX.1L1	HCMCBX_001-SP000014	MCBX	700	700	100%		550	550	389	
MCBX.1L5	HCMCBX_001-SP000010	MCBX	690	548	90%		550	500	350	
MCBX.1R1	HCMCBX_001-SP000024	MCBX	700	675	100%		550	550	389	
MCBX.1R5	HCMCBX_001-SP000022	MCBX	693	687	100%		550	550	389	
MCBX.2L1	HCMCBX_001-SP000013	MCBX	700	700	95%		550	550	369	
MCBX.2L5	HCMCBX_001-SP000012	MCBX	700	700	100%		550	550	389	
MCBX.2R1	HCMCBX_001-SP000034	MCBX	700	700	100%		550	550	389	
MCBX.2R5	HCMCBX_001-SP000004	MCBX	600	600	85%	NCR EDMS 391089	550	550	331	
MCBX.3L1	HCMCBXA001-CR000023	MCBXA	700	700	100%	90%	550	550	389	350
MCBX.3L5	HCMCBXA001-CR000027	MCBXA	700	654	100%	80%	550	550	389	311
MCBX.3R1	HCMCBXA001-CR000031	MCBXA	700	680	100%	90%	550	550	389	350
MCBX.3R5	HCMCBXA001-CR000030	MCBXA	700	700	100%	80%	550	550	389	311

Training quenches in RCBXx.x1 in Post LS2 (combined+individual)



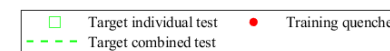
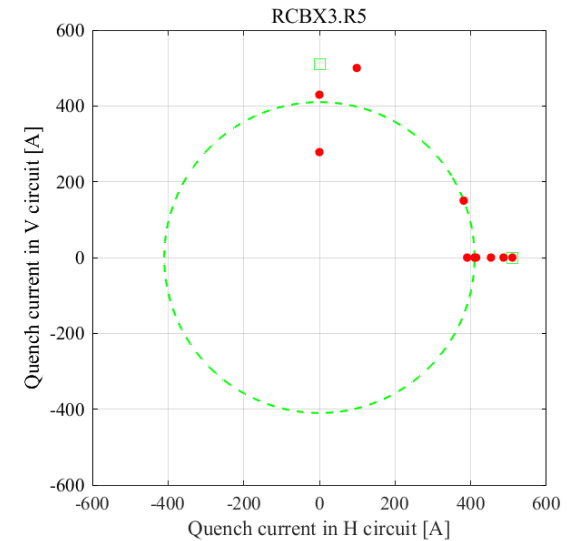
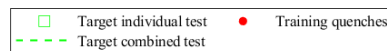
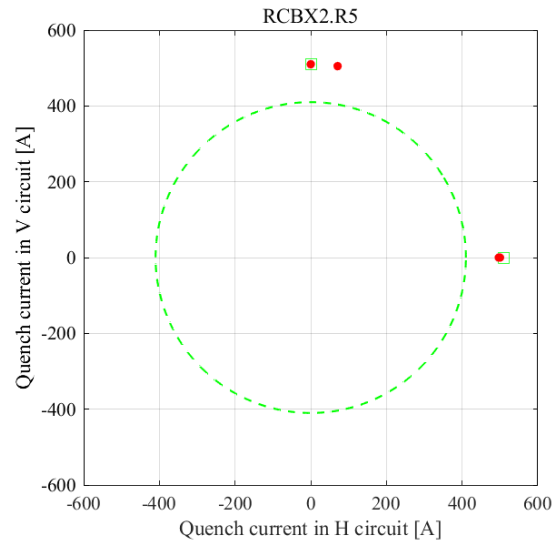
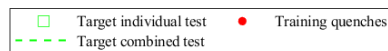
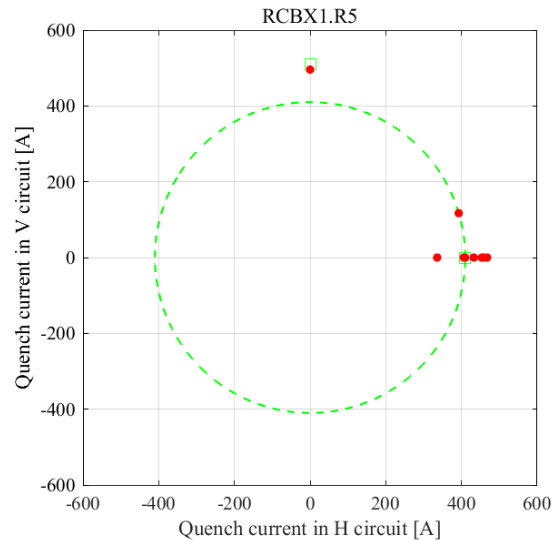
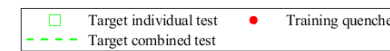
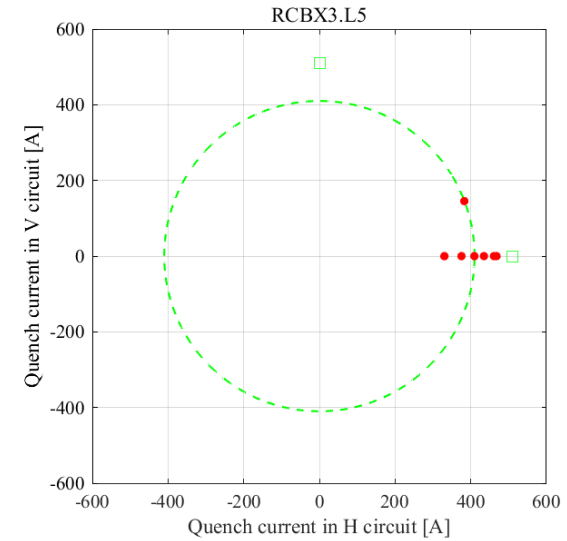
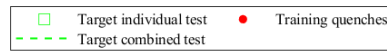
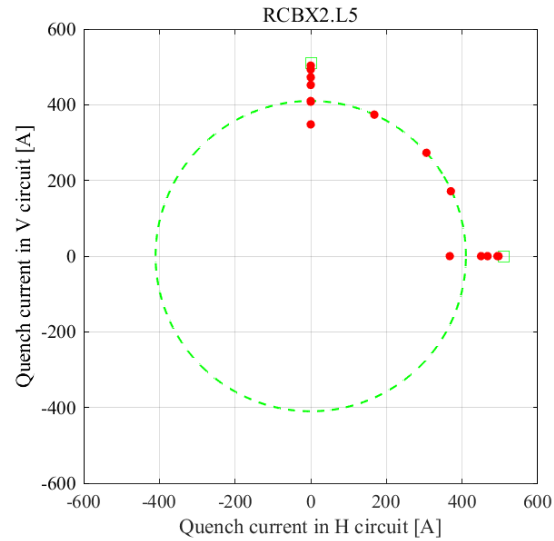
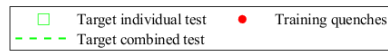
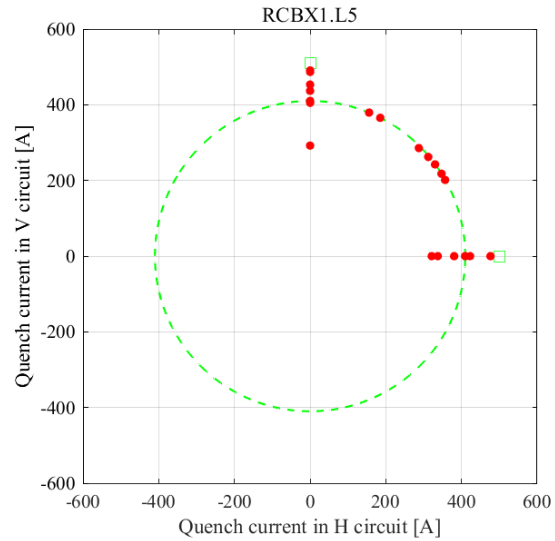
Ranking 1,2,3

***, ***, ***



*, **, *

Training quenches in RCBXx.x5 in Post LS2 (combined+individual)



Ranking 1,2,3

, , ,

, , ,

Wrap up

	Q1	Q2	Q3	MCBX	MCBX1,2,3 Powering test	
IR1	25MGy @580 fb ⁻¹	27MGy @530 fb ⁻¹ 30MGy @580 fb ⁻¹	15MGy @580 fb ⁻¹	100% powering test (95% for 2L1)	***, ***, *** for L1 * , ** , * for R1	HQ issue on Q1.R1
IR5	25MGy @580 fb ⁻¹	27MGy @530 fb ⁻¹ 28MGy @580 fb ⁻¹ Both on Q2a and Q2b	20MGy @580 fb ⁻¹	100% powering test (85% for 2R5, 90% for 1L5)	* , * , ** for L5 ** , ***, ** for R5	
	First : Q1L1 Second: Q1R5	First : Q2L1 Second: Q2R5	First : Q3L1 Second: Q3L5 Third : Q3R5			

My first choice @ 530 fb⁻¹ : Q1, Q2, Q3L1 → major constraint for dismantling

If L (2025+2026)> 530 fb⁻¹: Q1L1 , Q2R5, Q3L1 (and Q3L5)

Note: during YETS test, RCBX circuits IR1 & IR5 are tested only individually up to 300A

The baseline is also to keep the present spare triplet cryo-magnets (Q1, Q2 and Q3) , plus the above selection.
Q1 magnet was tested at cold in 2018 at SM18, but the tests are still pending for Q2 and Q3!