



BE-ABP-CEI
**Coherent Effects and
Impedance**

Giovanni RUMOLO

David AMORIM
Chiara ANTUONO
Xavier BUFFAT
Elena DE LA FUENTE
GARCIA
Lorenzo GIACOMEL
Dora GIBELLIERI
Miguel GONZALEZ
TORRE
Fredrik GROENVOLD
Giovanni IADAROLA
Erik KVIKNE
Christophe LANNOY
Szymon LOPACIUK
Elena MACCHIA
Lotta METHER
Elias METRAL
Nicolas MOUNET
Konstantinos
PARASCHOU
Leonardo SITO
Roxana SOOS
Carlo ZANNINI

Coherent Effects and Impedances section (CEI) – general information

Giovanni Rumolo

CEI Section Meeting, 08/08/2024

Scientific secretary: Chiara Antuono

<https://indico.cern.ch/event/1434653/>

New arrivals

- Bernardo Abreu Figueiredo, welcome!
- Doctoral student with Giovanni Iadarola, will work on Xsuite, in particular “Development of computing techniques for accelerator physics in the Xsuite framework”
 - Optimisation techniques for accelerator physics problems
 - Performance speed-up of beam dynamics simulations
 - Application of automatic differentiation techniques to accelerator physics





New arrivals ... and departures ☹️

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- Doctoral student with Giovanni Iadarola, will work on Xsuite, in particular “Development of computing techniques for accelerator physics in the Xsuite framework”
 - Optimisation techniques for accelerator physics problems
 - Performance speed-up of beam dynamics simulations
 - Application of automatic differentiation techniques to accelerator physics
- Josephine will be leaving CERN next week (15 August 2024) and will move to a new phase of her career evolution – all the very best for the next challenges!





Arising matters

- CERN Announcements for the **Locks and Keys service** and the **Main Reception** (email from Stéphanie)
 - The **Locks and Keys service is moving to Building 73** ([link](#))
 - The Locks and Keys service will be located in Building 73 (73/R-002), next to the CERN Stores. The opening hours will remain unchanged (7.30 a.m. to 12.00 noon and 1.00 p.m. to 4.30 p.m., Mondays to Fridays).
 - The **new CERN Community Support Centre** ([link](#))
 - The area in Building 33 that was formerly occupied by the Main Reception has undergone a complete transformation in order to house the new CERN Community Support Centre (CCSC), which will open on 1 August 2024.
 - The CCSC will be operated by the CERN Service Desk team from 7.00 am to 6.30 pm, Monday to Friday. It will be the first line of support for all CERN services and activities that were previously housed in Building 55: contractor registration, delivery of access cards and professional visitor cards, biometry registration and dosimeter distribution, delivery of Swiss legitimation and French MAE cards, online training stations and general online and on-site assistance. These services will all be centralised on the ground floor of Building 33.



IPP meeting last Friday 2 August

- SPS recovery after magnet exchange (Kostas)
 - Scrubbing and performance recovery has been analysed by Kostas for the cases of magnet exchange in the SPS (4 times in 2024)
 - Dynamic pressure rise is higher in the region of the exchanged magnet when it is an MBA (non-coated spare) than when it is an MBB (coated spare). However, we know that MBA scrubs faster (higher SEY threshold for e-cloud build-up)
 - In all cases, pressure and beam conditions can be efficiently recovered in about half a day, especially if pressure interlock thresholds are temporarily relaxed around the region of the exchanged magnet to allow for faster scrubbing

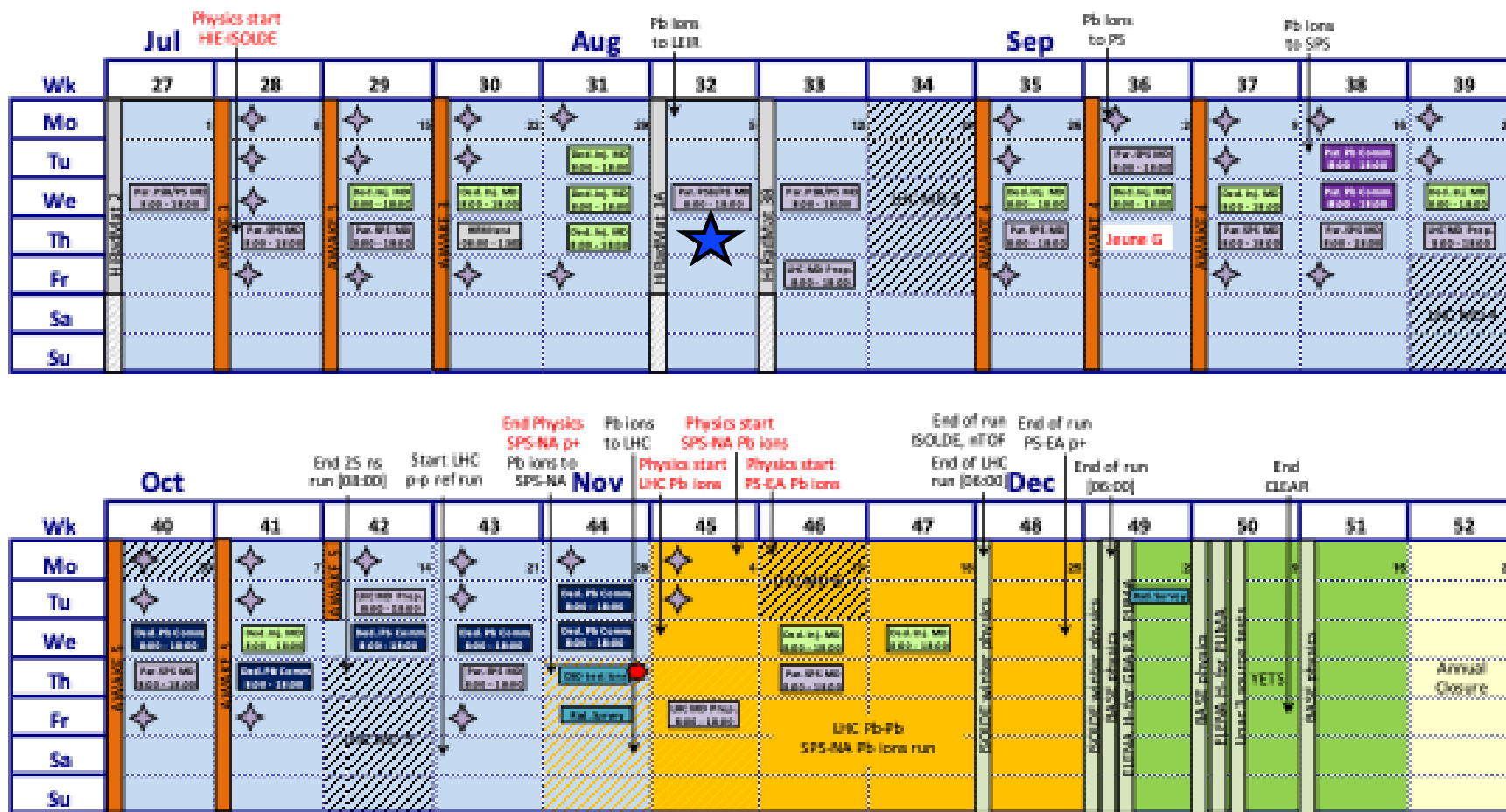


IPP meeting last Friday 2 August

- BCMS beams (Foteini, Sofia)
 - Low emittance
 - BCMS beam highly optimized along the injector chain to produce the lowest possible emittance at a given intensity, space charge in the SPS is important for this beam – as expected
 - 20% decrease of emittance seen at LHC injection when comparing standard and BCMS variants (as expected), the gap however reduces to 15% by the end of the injection process and to 10% at the beginning of stable beams. This results in 5% gain in integrated luminosity
 - The emittance growth on the injection plateau has a part that has a clear e-cloud shape and a part that equally affects all bunches (consistent with IBS globally, but the model would expect only in H while it is observed shared in H and V)
 - Low tail
 - A low-tail version has been used for LHC physics production, in which tails have been made more Gaussian by using scraping in the PSB and optimizing PS transition crossing (tails appear to come also from Linac4)
 - Lower q-values are indeed measurable at LHC injection
 - The impact of tails on losses at collision seems to be evident both in MDs and in operation



2024 injectors schedule v2.1



- No dedicated nor long parallel SPS MDs for three weeks due to HiRadMat run and then LHC MDs
- Vacuum problem in Sectors 1 and 4 appeared when no FT beam in the SPS supercycle, still there?



High intensity beams in the SPS

- Following the 938 MHz HOM coupler breakage in cavity 3 of the 200 MHz system in the SPS, a limit to $2e11$ p/b for LHC beams was temporarily enforced in the SPS
- Following discussion at and after the LMC last week, it was decided that
 - The beams for the LHC MDs (2x 48b with $2.3e11$ p/b) are much below the LIU beam specs (33% of intensity in 33% shorter trains) and can be considered 'safe'. They will be therefore prepared in the injectors
 - HiRadMat has accepted to run with $1.9-2.0e11$ p/b this week and the next one, therefore stays within the current limit
 - LIU MDs can take place at the end of August with the full LIU beam (4x 72b with $2.6e11$ p/b injected) but without acceleration to 450 GeV
 - Full-blown LIU MDs including acceleration will gently resume after the week of the Jeûne Genovois, when it is expected that more information on the post-mortem analysis and miscellaneous inspections will be available and the RF team will be also available in case of further failures of this type



2024 LHC schedule v2.0

	Jul				Aug				Sep				Oct
Wk	27	28	29	30	31	32	33	34	35	36	37	38	39
Mo	1	8	15	22	29	5	12	19	26	2	9	16	23
Tu													
We								MD 3					
Th						★				Jeune G.			
Fr													
Sa													MD 4
Su													

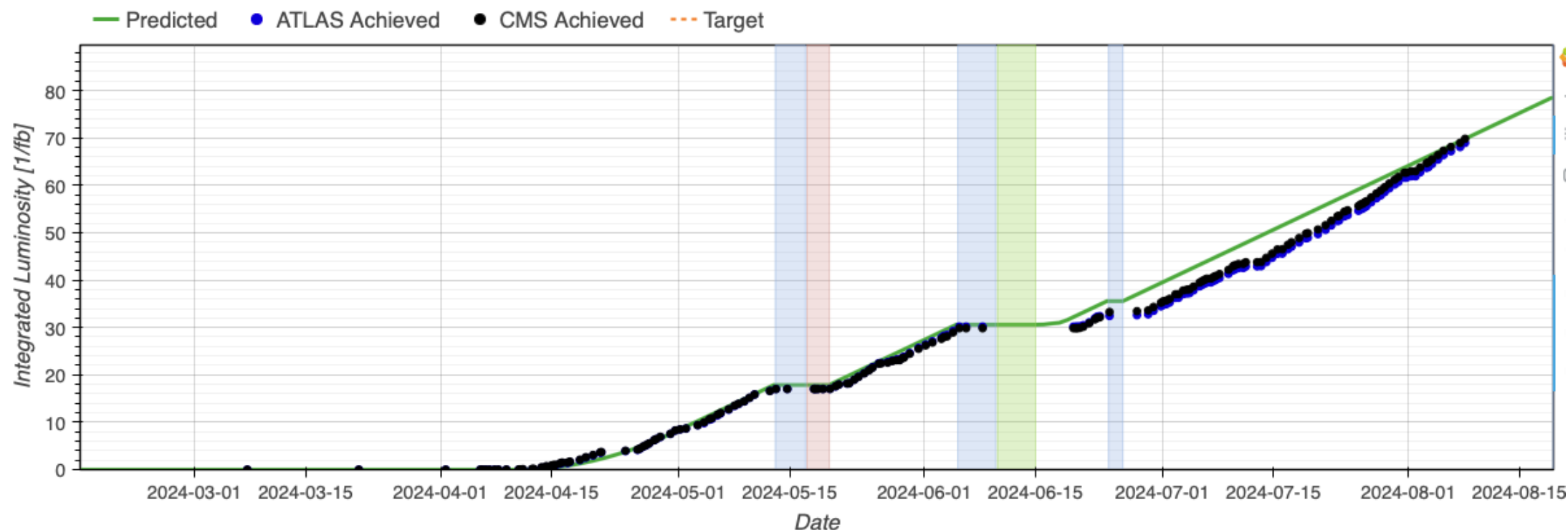
- Physics production with very good availability

	Nov							Dec					
Wk	40	41	42	43	44	45	46	47	48	49	50	51	52
Mo	30	7	14	21	28	4	11	18	25	2	9	16	23
Tu				TS2	p-p ref run		MD 6						
We													Xmas
Th				p-p ref setup	★		Pb-Pb Ion run			YETS			Annual Closure
Fr			MD 5		Cryo reconfig.								
Sa					Pb Ion setting up								
Su													



LHC Lumi

- LHC integrated lumi finally back on target following a very good production period with high availability and large fraction in stable beams (>60%)





LHC beam parameters

- Nice emittance at the beginning of stable beams ($\sim 1.7 \mu\text{m}$) and now great agreement between BSRT and lumi from experiments after BSRT calibration!

