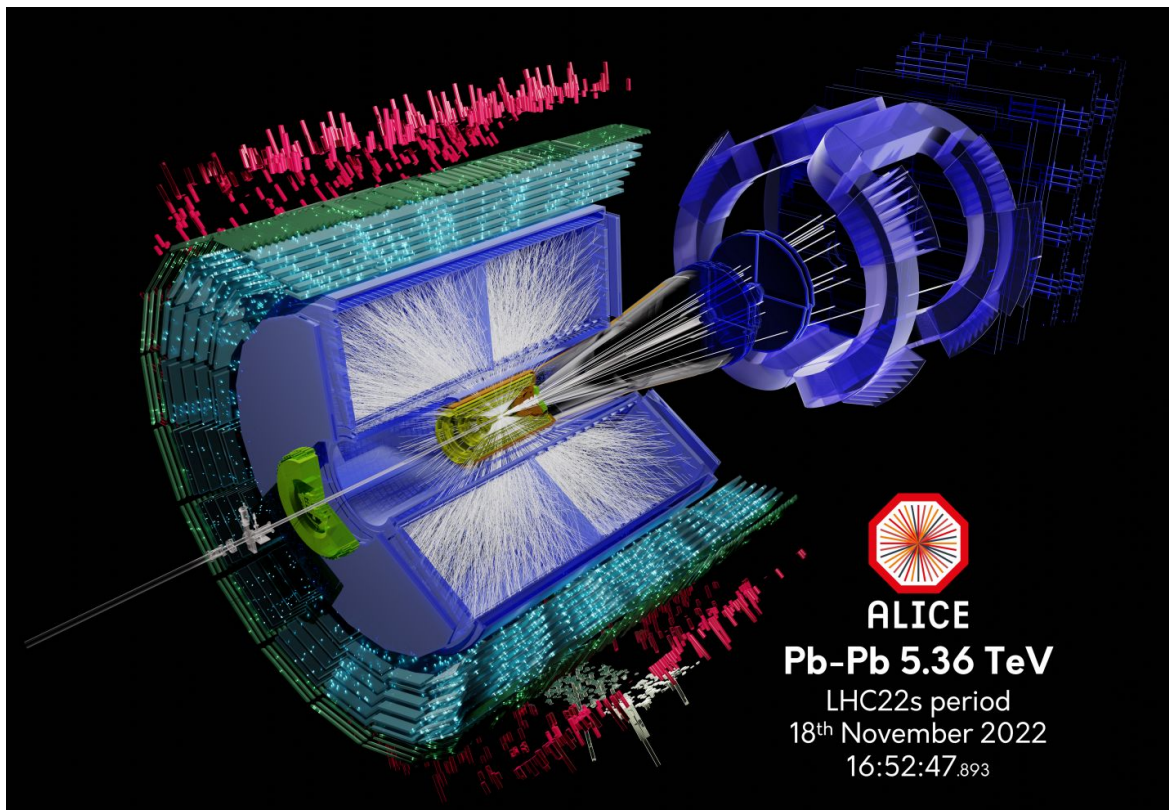




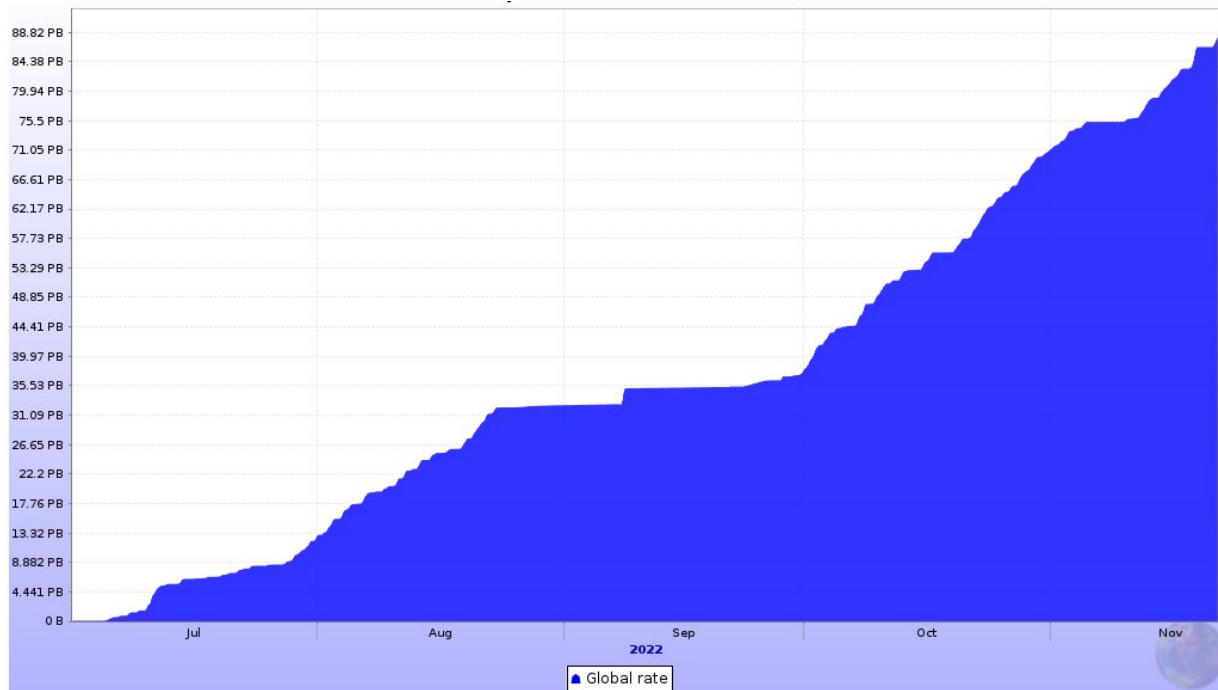
# ALICE production plans and resources requirements

November 2022 status  
L. Betev

# End of 2022 data taking - Pb-Pb @5.36TeV



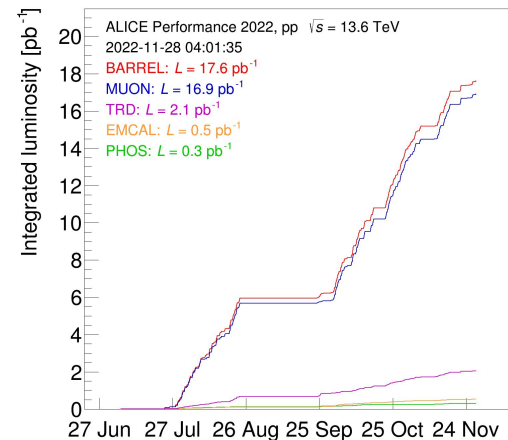
# Data accumulation - TFs and CTFs



- Since July 1<sup>st</sup> collected 99 PB  
85% of CTFs and 15% of rawTFs
- + 23.5 PB from October 2021 to  
June 2022, 15 PB before October  
2021,
- Total **137.5 PB with new detector**
- Processing plans follow

# 2022 data taking

- pp data taking at top energy
  - Low-rate magnet scans with different polarities of the solenoid
  - Interaction rate ramp-up from 50 kHz to 500 kHz + 1 MHz tests
  - High-rate tests at 2/3/4/5 MHz
  - Beam rate scan from 1 MHz to 0.6 kHz
- Collected 16.6/pb of pp @ 650 kHz and 1.2 MHz INEL IR
  - $1.4 \cdot 10^{12}$  collisions as part of Run 3 pp physics programme ( $\mu < 0.1$ )
  - Unprecedented pp data sample, to be compared with  $\sim 2.6 \cdot 10^9$  events in Run 2
- Planned 2022 Pb-Pb run postponed to 2023:
  - 2 fills with Pb-Pb stable beams on November 18, collisions at low IR (max 61 Hz)
  - 0.15/ub - 1M MB events, 3.7 PB of data CTFs + rawTFs
  - 1M events enough for many basic measurements to validate performance



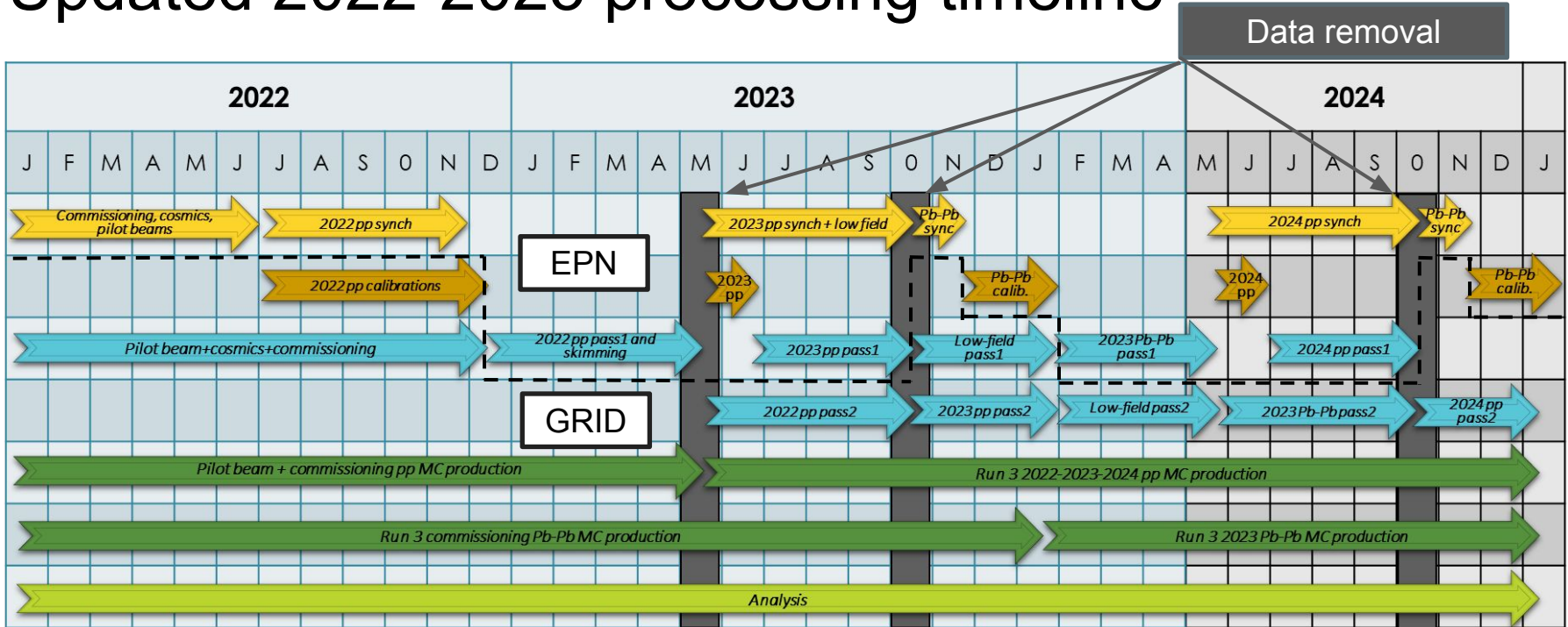
# Data and simulation processing

- Run 3 asynchronous reconstruction (GRID and EPN)
  - pp @ 13.6 TeV - about 75% of the runs collected in 2022 already processed with first pass of async reconstruction for commissioning
  - Pb-Pb @ 5.3 TeV: 2 passes already performed with increasing calibration quality
- Extensive Run 3 simulation
  - New production of MB pp @ 900 GeV anchored to pilot beam 2022 (pass2)
  - First pp General Purpose @ 13 TeV, anchored to 2022 periods
  - Unanchored simulation of Pb-Pb at 60 Hz, 5.36 TeV with realistic filling scheme
  - Pb-Pb targets  $2.6 \times 10^8$  events for the validation against 2018 Pb-Pb results

# 2022 pp data processing plans

- Calibrations needed for 1<sup>st</sup> apass for physics expected in December
  - Few partial reconstructions needed for that to complete
- During EYETS use EPNs + CERN
  - In GPU and CPU - full pass is about 1 month (Jan-Feb)
  - AO2D (2 replicas): 1.4e12 collisions **~11 PB** - keep these until the end of skimming
- 2 months to tune and validate selections on pass1 AO2Ds (Feb-Mar)
  - Skim ~75 PB of CTFs with total  $\sim 10^{-3}$  rejection factor before the end of EYETS
- pp @ 650 kHz CTF will be removed once skimmed
- In addition, plan to keep ~1/pb (4 PB) of the same as MB, because the MB sample of 3/pb at 5.3 TeV (pp ref) has been postponed to the end of 2023

# Updated 2022-2023 processing timeline



1<sup>st</sup> year almost all EPN processing capacity dedicated to data taking, most of them available from December to April



# Computing resources 2022-2023



# Computing resources needs for 2022 - 2023

- ALICE resource requests for 2023 endorsed by CRSG in April 2022
  - All entered in CRIC
- No HI in 2022 - reduction of planned resource usage in 2023 with caveats
- Measured larger CTF average event size during 2022 pp data taking
  - TPC +30% more clusters @ 1.25 MHz, strongly depends on IR - under study
  - The assessment will be available in December/January
  - Compression strategy B postponed to 2024 (after HI) - still to see what that is
- 2023 data taking with conservative compression strategy A
  - Impact on tape requirements for 2023, likely target O2 buffer needed too
  - The LHC schedule 2023/2024 is being re-discussed
  - Could require more computing resources if longer HI period in 2023

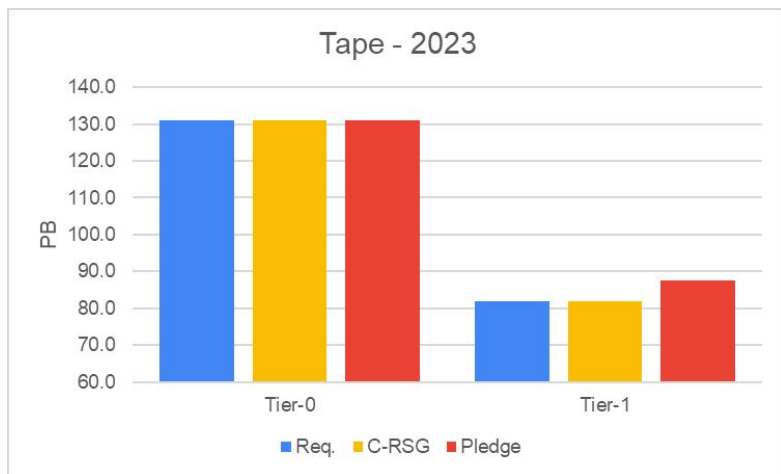


# Pledged resources for 2023

# Tape in 2023

## Pledges sufficient to support ALICE data taking in 2023

- Tape inline with requests at T0 and surplus at T1 (+5.7 PB)
  - Compensates the tape pledged by RU, all FAs committed to increase support if necessary
  - 12 PB KISTI Tapeless Archive Storage

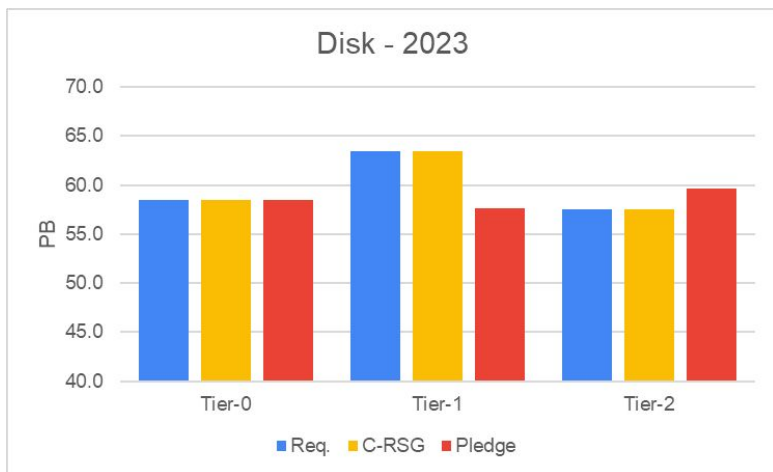


(\*) 5.7 PB of RU pledged tape for 2023 considered in the plot

# Disk in 2023

## Not enough to support ALICE data processing in 2023 - 3.7 PB deficit

- T0 in line with request
- T1s under pledged disk (-5.7 PB)
- T2s surplus of 2.2 PB

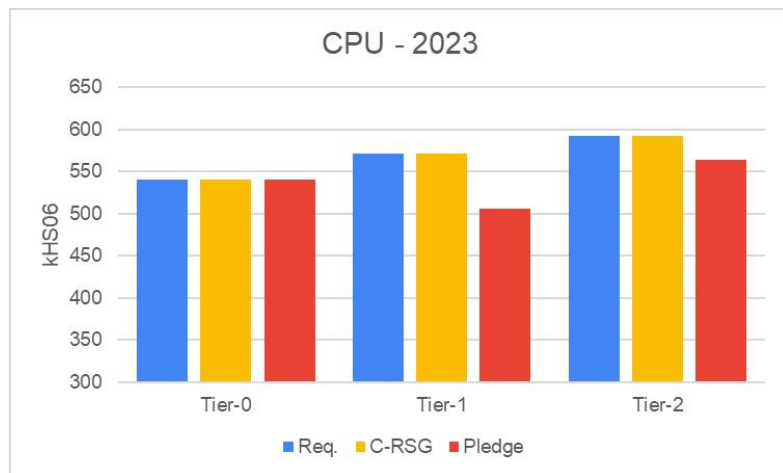


(\*) 4.5(3.0) PB of RU + JINR pledged T1(T2) disk for 2023 considered in the plot

# CPU in 2023

## Pledges sufficient to support ALICE data processing in 2023

- Slight deficit of pledged CPU (-5%)
  - Mainly due to T1s under pledges (-66 kHS06)



(\*) 32.8(34.8) kHS06 of RU + JINR pledged T1(T2) CPU for 2023 considered in the plot

# Computing resource estimates for 2024

		2022		2023				2024		
		C-RSG	Pledge	C-RSG	RU (incl. JINR)	C-RSG 2023 / C-RSG 2022	C-RSG 2023 / Pledge 2022	Est.	Est. 2024 / C-RSG 2023	Est. 2024 / (C-RSG - RU) 2023
<b>ALICE</b>										
<b>CPU [kHS06]</b>	Tier-0	471	471	541	0	115%	115%	622	115%	115%
	Tier-1	498	448	572	83	115%	128%	655	115%	134%
	Tier-2	515	517	592	50	115%	115%	683	115%	126%
	<b>Total</b>	<b>1484</b>	<b>1436</b>	<b>1705</b>	<b>133</b>	<b>115%</b>	<b>119%</b>	<b>1960</b>	<b>115%</b>	<b>125%</b>
<b>Disk [PB]</b>	Tier-0	50.0	50.0	58.5	0.0	117%	117%	67.5	115%	115%
	Tier-1	55.0	49.7	63.5	9.2	115%	128%	71.5	113%	132%
	Tier-2	49.0	55.2	57.5	4.9	117%	104%	66.5	116%	126%
	<b>Total</b>	<b>154.0</b>	<b>154.9</b>	<b>179.5</b>	<b>14.1</b>	<b>117%</b>	<b>116%</b>	<b>205.5</b>	<b>114%</b>	<b>124%</b>
<b>Tape [PB]</b>	Tier-0	95.0	95.0	131.0	0.0	138%	138%	167.0	127%	127%
	Tier-1	63.0	71.8	82.0	11.9	130%	114%	102.0	124%	145%
	<b>Total</b>	<b>158.0</b>	<b>166.8</b>	<b>213.0</b>	<b>11.9</b>	<b>135%</b>	<b>128%</b>	<b>269.0</b>	<b>126%</b>	<b>134%</b>

- First estimates for 2024 discussed with C-RSG and endorsed during fall RRB
- Standard growth for CPU (+15%) and disk (+14%) in 2024 compatible with flat budget, step for tape (+56 PB)
- Without the expected RU+JINR contribution, the estimated growth exceeds the flat budget
- Resources of RU+JINR contribution will be missing unless they are not compensated by the other Fas
- The LHC schedule for 2023 and 2024 is now being re-discussed. In the next months we will receive from LPC the conditions to use at the April 2023 RRB for 2024 requests