LHCC Referee Meeting

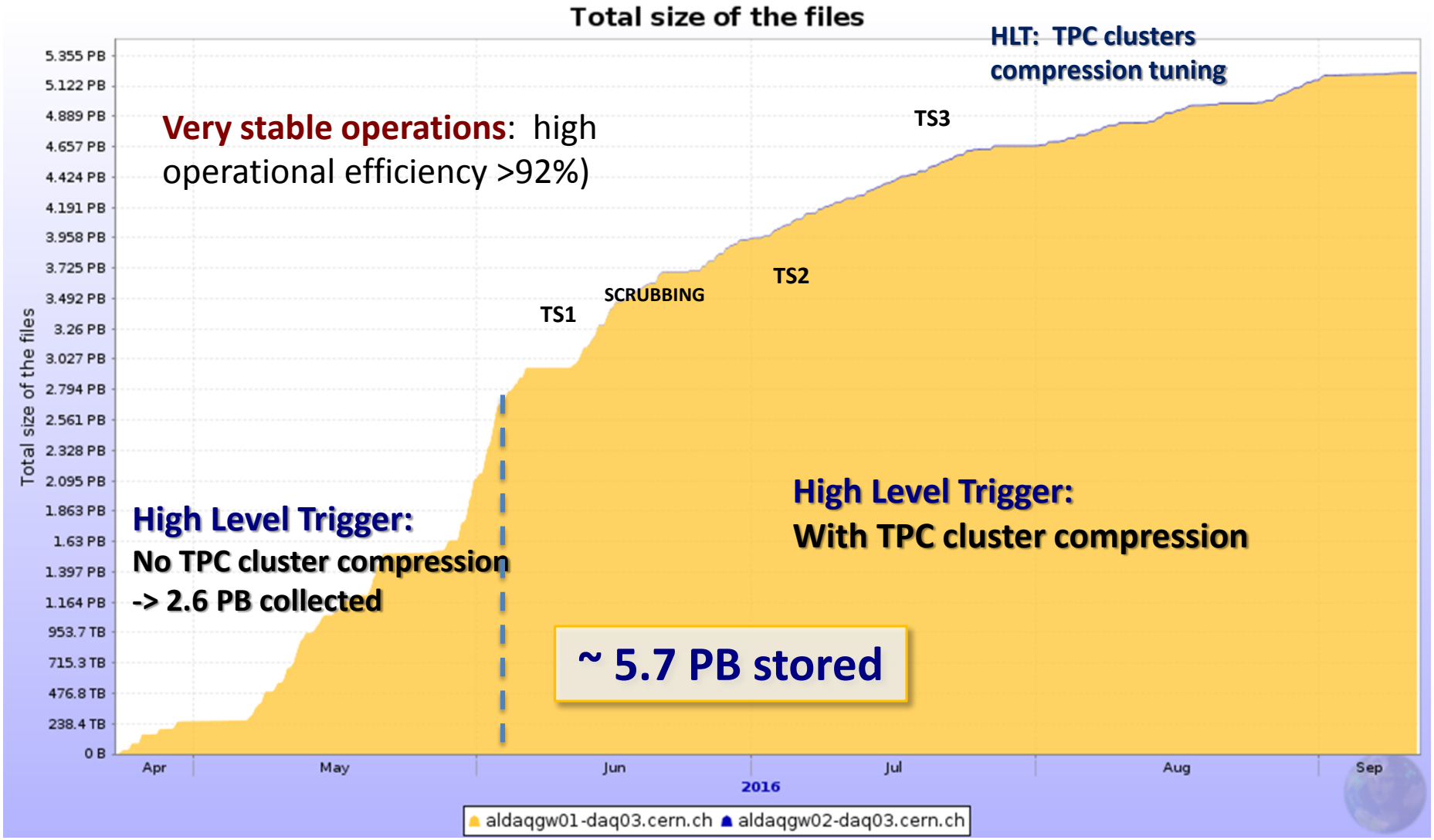
20/09/2016

# ALICE Status Report

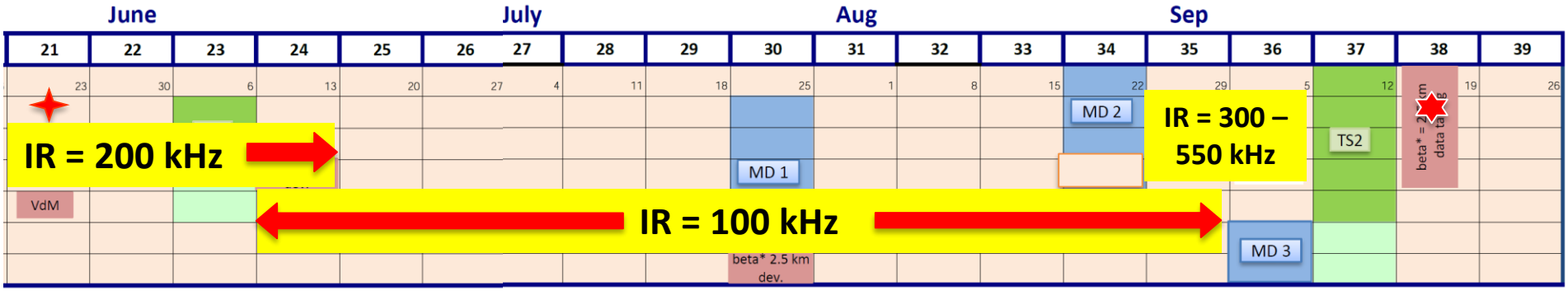
**Predrag Buncic**

CERN

# 2016 data taking



# 2016 data taking - optimization



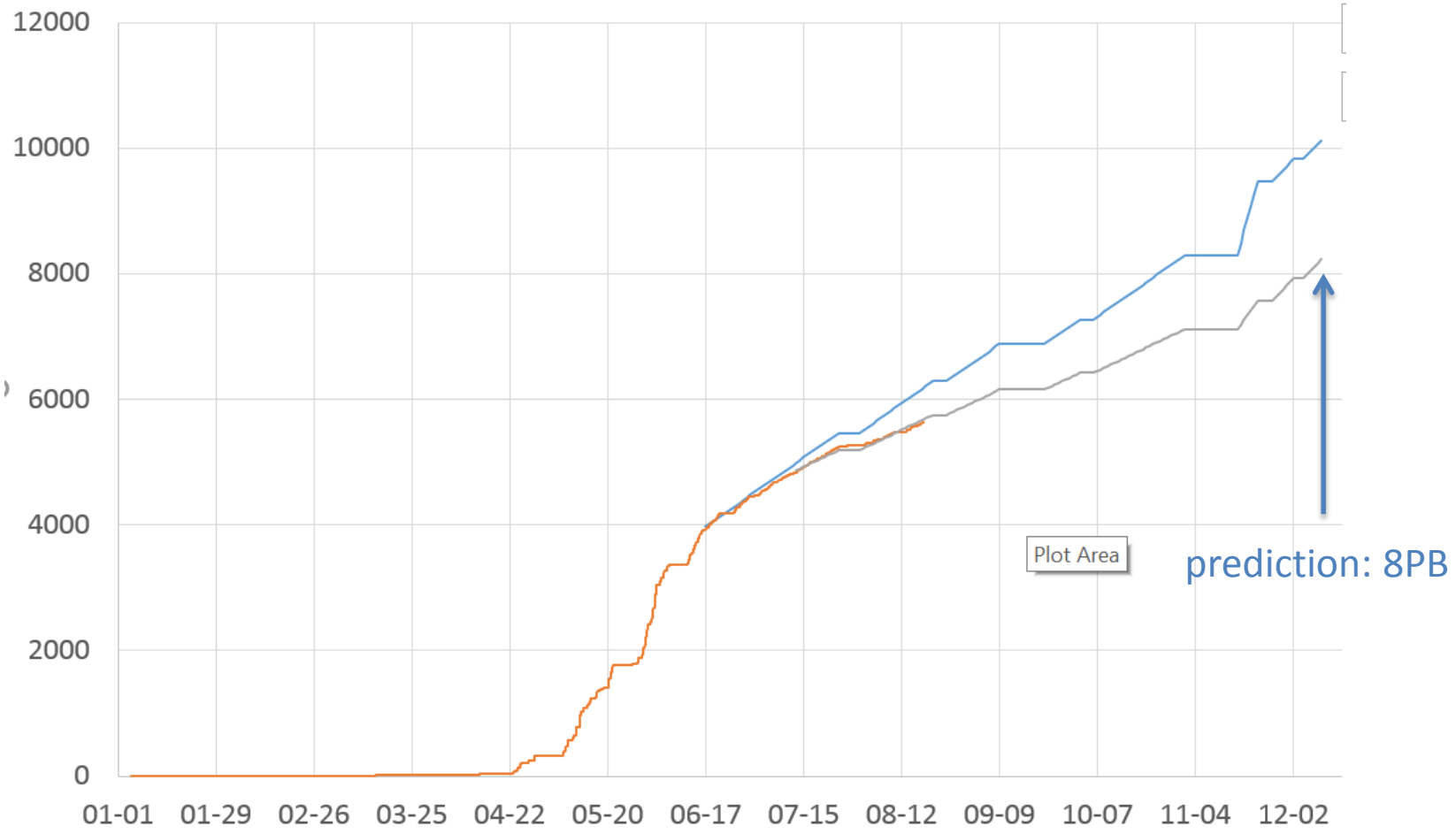

- **Period: Week 24 – Week 35**
- IR = 100kHz

- Optimization of data taking with aim to
  - Reduce data volume written to tape
  - Collect data of better quality by reducing pileup and distortions in TPC

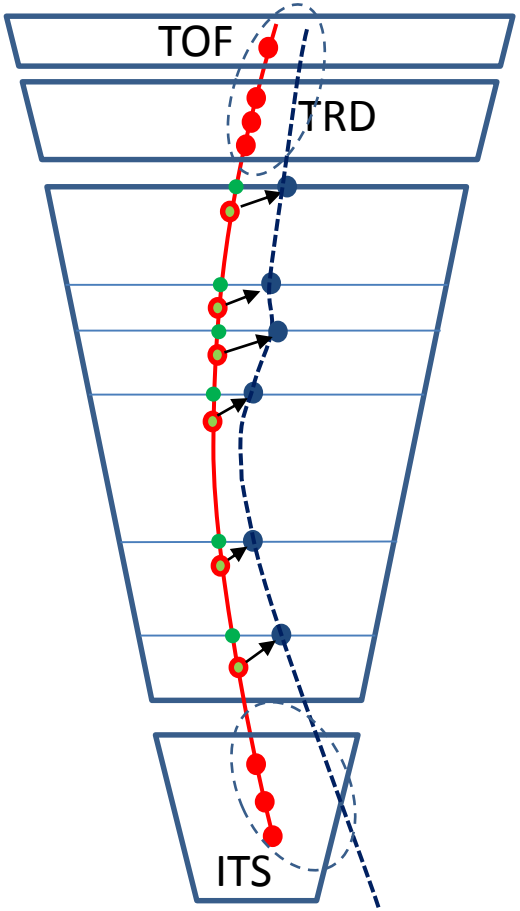
- **Period: Week 35 – Week 36**
- IR = 300 – 550 kHz

- The total MUON luminosity collected during this period is ~2.3 $pb^{-1}$ (~25% of the total for 2016).
- Collected CALO-only gamma triggers, for an integrated luminosity of ~2 $pb^{-1}$

# Recorded data volume



# TPC Space Point Distortions

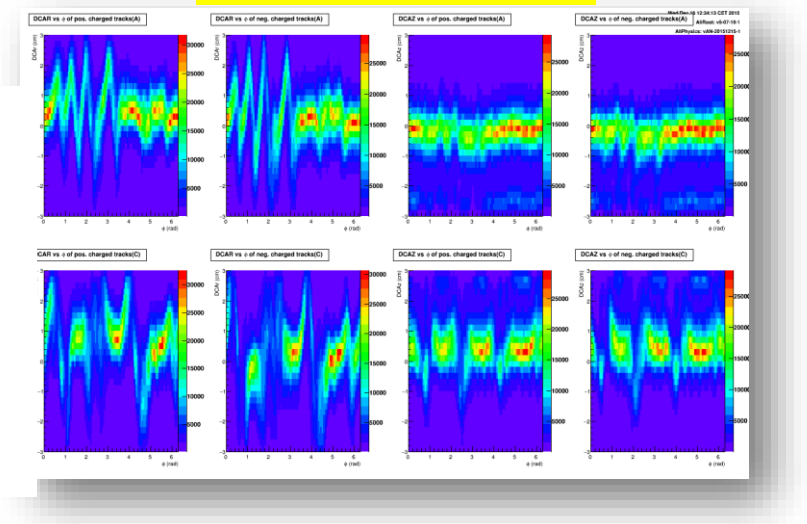



- Larger than expected Space Point distortions in the TPC seen in Run2 via tracking observables (Distance of Closest Approach to primary vertex)

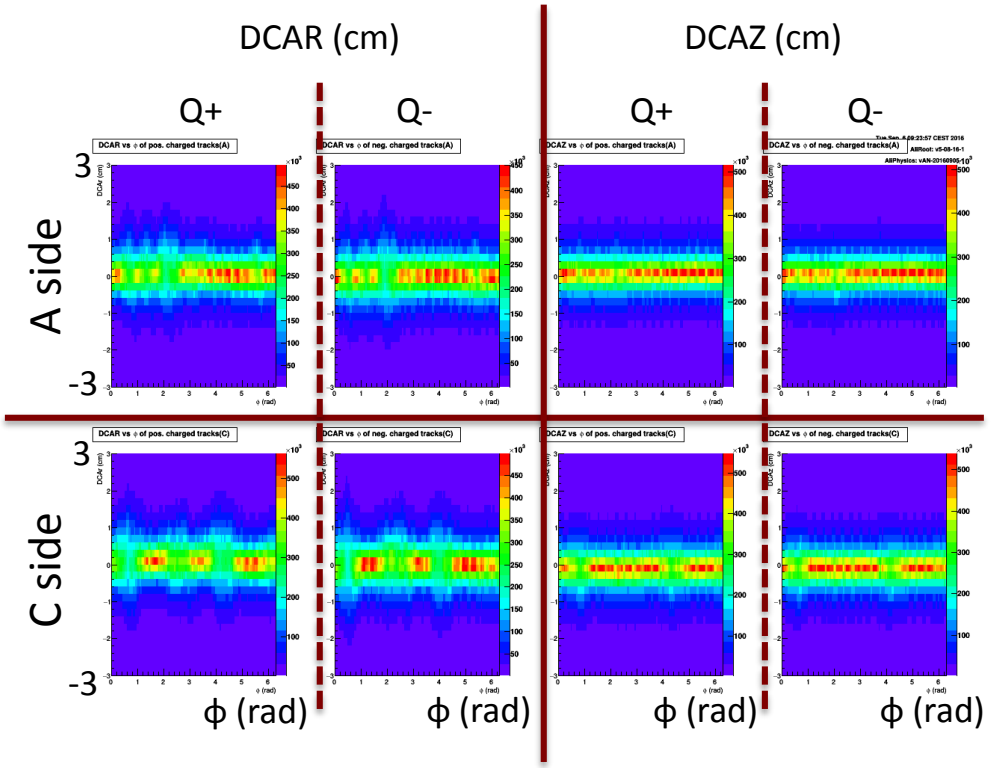
- Time dependent calibration procedure to correct the distortions as foreseen for Run3
  - Use inner (ITS) and outer (TRD, TOF) detectors
  - 3D distortion vector for each TPC voxel
  - Smooth parameterization used in reconstruction

# TPC Space Point Distortions

**Before calibration**



Pb-Pb @ 5.02 TeV, **IR = 7.5 kHz**




**After calibration**

# 2015 data re-processing

Current status of **data processing** with the new TPC Space Point distortion calibration procedure:

- pp @ 5.02 TeV: fully calibrated and reconstructed
- PbPb @ 5.02 TeV: 100% calibrated, >75% reconstructed (25% ongoing)
- pp @ 13 TeV (2016): ongoing

**PbPb @ 5.02 TeV reconstruction**

| | | | | Raw data | | | Reconstructed | | | | | Timing » | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15o | full | | | | | | | | | | | | |
| Production | Description | Status | Run Range | Runs | Chunks | Size | Chunks | | Size | | Events | Running | Saving |
| LHC15o_pass1 | LHC period LHC15o - Full production pass 1, ALIROOT-6702 | Running | 245683 - 246994 | 112 | 1,331,990 | 1.805 PB | 1,324,280 | 99% | 662 TB | 36% | 409,040,015 | 1258y 322d | 18y 140d |
| LHC15o_pass2_lowIR | LHC period LHC15o - Full production pass 2, low IR runs, ALIROOT-6663 | Completed | 244917 - 246392 | 13 | 45,122 | 47.92 TB | 44,975 | 99% | 16.66 TB | 34% | 9,570,845 | 28y 30d | 118d 5:06 |

# 2016 data processing

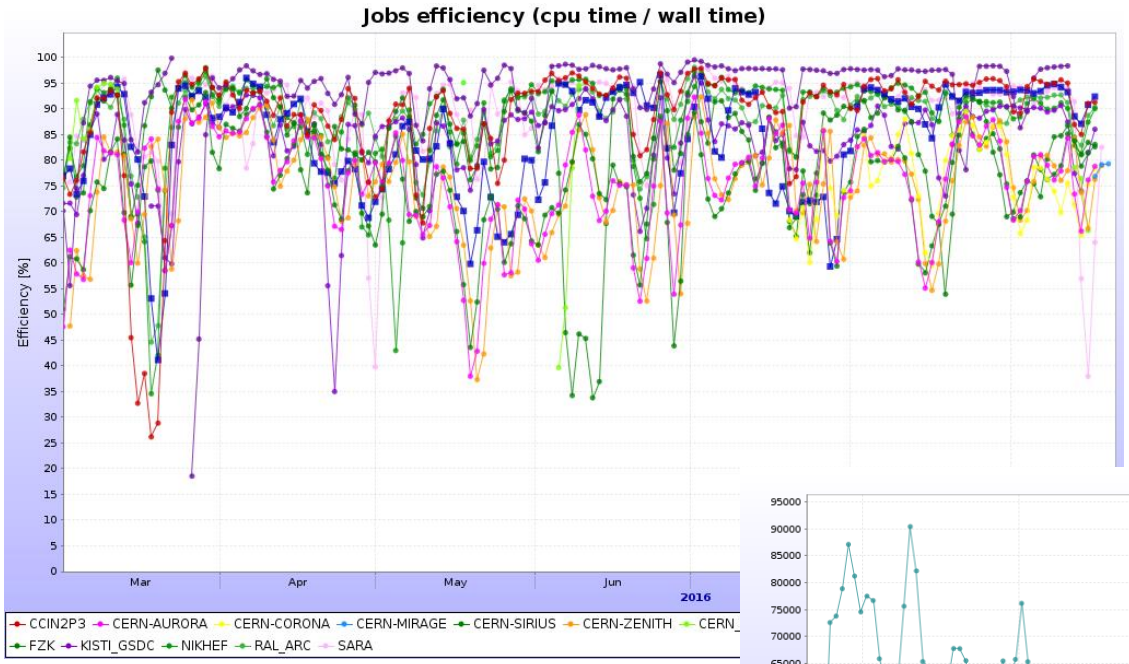
Processing requ

| | | | | Raw data | | | Reconstructed | | | | | Timing » | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| muon | 16 | | | | | | | | | | | | |
| Production | Description | Status | Run Range | Runs | Chunks | Size | Chunks | | Size | | Events | Running | Saving |
| LHC16n_muon_calo_pass1 | LHC period LHC16n - Muon+Calorimeters reconstruction pass 1 | Completed | 260649 - 261100 | 78 | 64,667 | 13.67 TB | 64,667 | 100% | 7.651 TB | 55% | 483,419,227 | 21y 138d | 153d 4:49 |
| LHC16m_muon_calo_pass1 | LHC period LHC16m - Muon+Calorimeters reconstruction pass 1 | Completed | 260218 - 260647 | 44 | 129,897 | 215.6 TB | 129,894 | 99% | 6.409 TB | 2% | 213,265,306 | 12y 166d | 240d 22:26 |
| LHC16l_muon_calo_pass1 | LHC period LHC16l - Muon+Calorimeters reconstruction pass 1 | Completed | 258883 - 260187 | 94 | 195,840 | 323 TB | 195,197 | 99% | 9.685 TB | 3% | 315,922,284 | 19y 69d | 1y 17d |
| LHC16k_muon_calo_pass1 | LHC period LHC16k - Muon+Calorimeters reconstruction pass 1 | Completed | 256504 - 258537 | 269 | 720,762 | 1.159 PB | 717,742 | 99% | 28.56 TB | 2% | 1,022,829,035 | 63y 349d | 7y 32d |
| LHC16j_muon_calo_pass1 | LHC period LHC16j - Muon+Calorimeters reconstruction pass 1 | Completed | 256146 - 256420 | 60 | 305,986 | 512.9 TB | 305,976 | 99% | 5.522 TB | 1% | 183,667,445 | 13y 209d | 1y 166d |
| LHC16i_muon_calo_pass1 | LHC period LHC16i - Muon+Calorimeters reconstruction pass 1 | Completed | 255515 - 255618 | 21 | 168,302 | 282.9 TB | 167,891 | 99% | 3.133 TB | 1% | 95,337,721 | 7y 289d | 289d 22:08 |
| LHC16h_muon_calo_pass1 | LHC period LHC16h - Muon+Calorimeters reconstruction pass 1 | Completed | 254378 - 255467 | 98 | 868,831 | 1.429 PB | 865,142 | 99% | 7.812 TB | 0% | 260,663,338 | 29y 315d | 3y 145d |
| LHC16g_muon_calo_pass1 | LHC period LHC16g - Muon+Calorimeters reconstruction pass 1 | Completed | 254124 - 254332 | 27 | 146,291 | 246.6 TB | 146,142 | 99% | 1.944 TB | 0% | 68,318,935 | 5y 93d | 251d 12:41 |
| LHC16f_muon_calo_pass1 | LHC period LHC16f - Muon+Calorimeters reconstruction pass 1 | Completed | 253614 - 253979 | 41 | 267,469 | 450.8 TB | 267,159 | 99% | 2.694 TB | 0% | 102,349,129 | 9y 329d | 342d 9:35 |
| LHC16e_muon_calo_pass1 | LHC period LHC16e - Muon+Calorimeters reconstruction pass 1 | Completed | 252603 - 253591 | 60 | 191,935 | 321.2 TB | 191,917 | 99% | 2.765 TB | 0% | 118,437,304 | 9y 194d | 280d 12:55 |
| LHC16d_muon_calo_pass1 | LHC period LHC16d - Muon+Calorimeters reconstruction pass 1 | Completed | 252235 - 252375 | 43 | 90,970 | 151.6 TB | 90,956 | 99% | 1.188 TB | 0% | 65,286,793 | 5y 66d | 132d 5:26 |
| | | | | | 3,150,950 | 5.048 PB | 3,142,683 | | 77.36 TB | | 2,929,496,517 | 198y 32d | 17y 228d |

**“Fast-track” reconstruction**

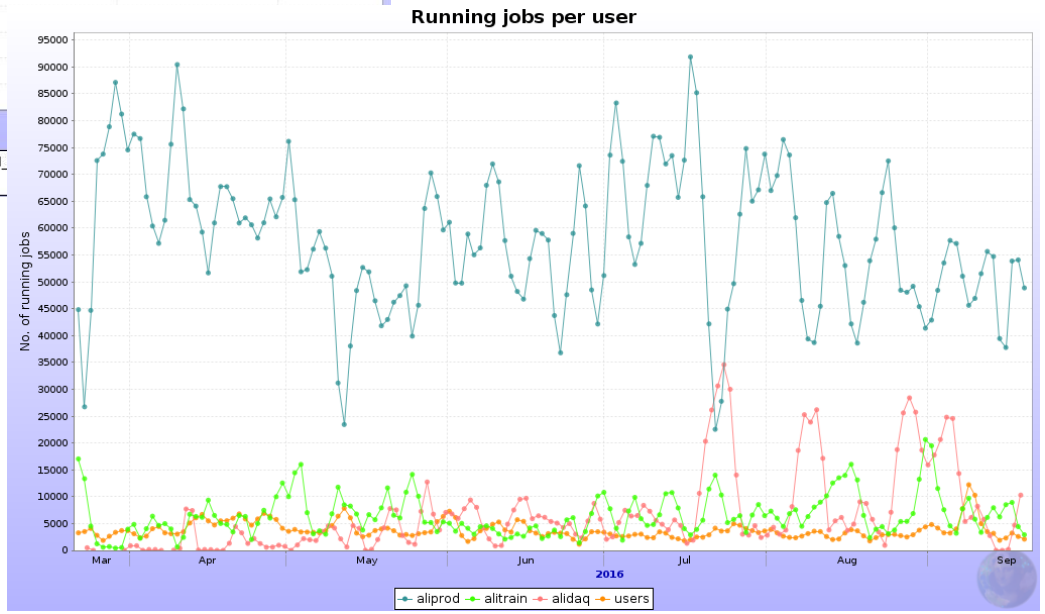
**3e9 events**

# ALICE data taking summary

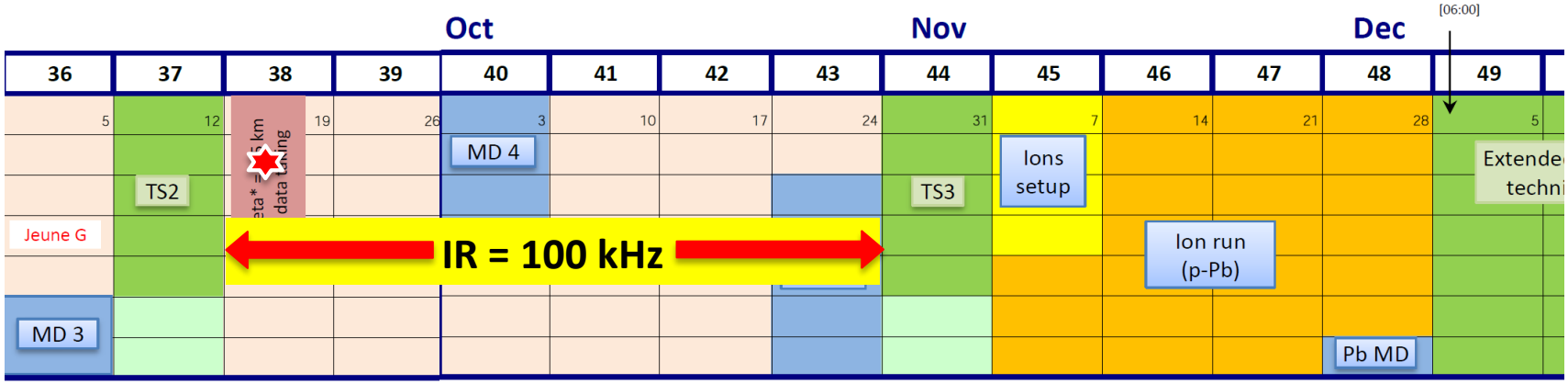



- In spite of increased share of I/O intensive reconstruction jobs the average job efficiency remains high on most of T1 sites

Efficiency better than 83%



# Next steps



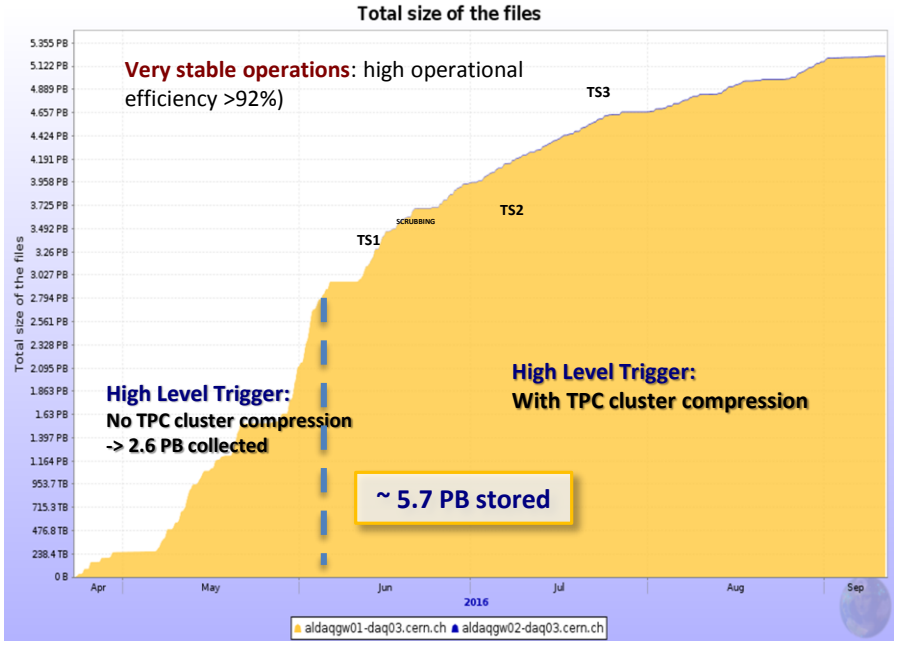

- **Weeks 38 – 43:** Continue pp Physics at 13 TeV at an IR = 100 kHz
- **Weeks 45 – 48:** p-Pb Physics at 5 and 8 TeV
- All Detectors are ready for the p-Pb run

- From October, start running MC productions anchored to reconstructed data in preparation for QM'2017

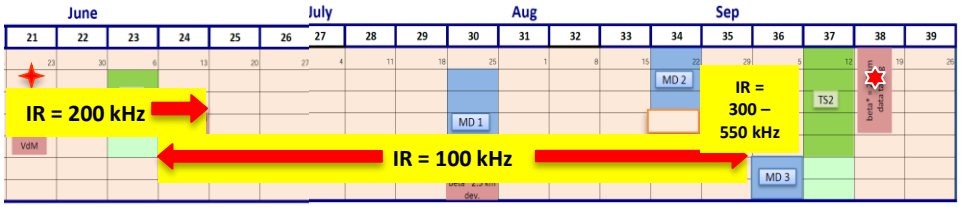
# Summary

# ALICE Summary (1)

- Run 2 data taking progressing very well
  - Steps were taken to reduce data volume written to tape
    - Running for most of time with lower the IR to reduce pileup in TPC
    - Shorter high IR period dedicated for MUON & CALO
    - HLT cluster compression improved from factor 4 to 6



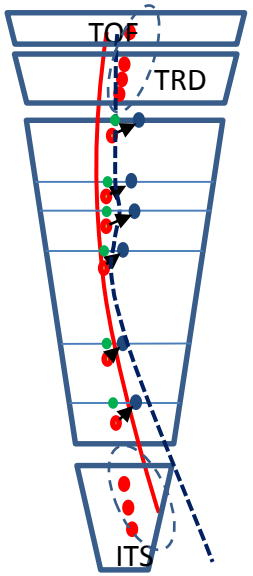

- This strategy allowed us to stay on track to meet the foreseen data taking goals without breaching the tape budget



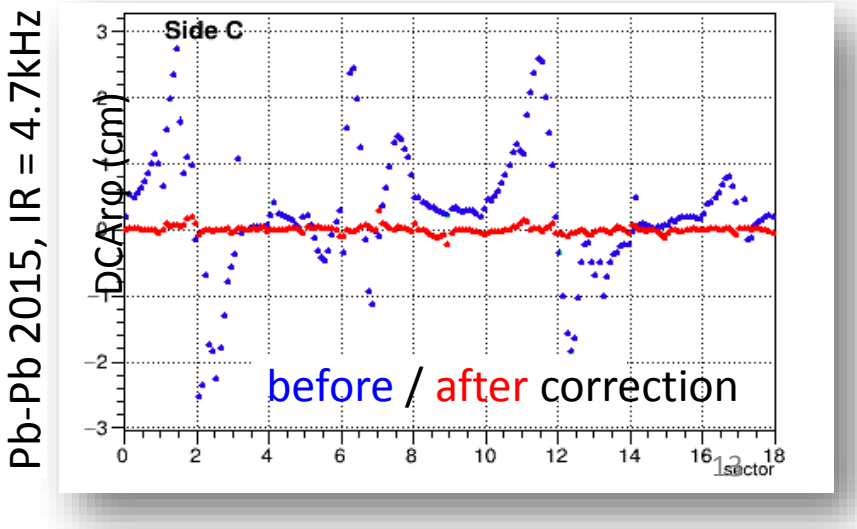

Tape budget for 2016 is 10PB will be respected

# ALICE Summary (2)

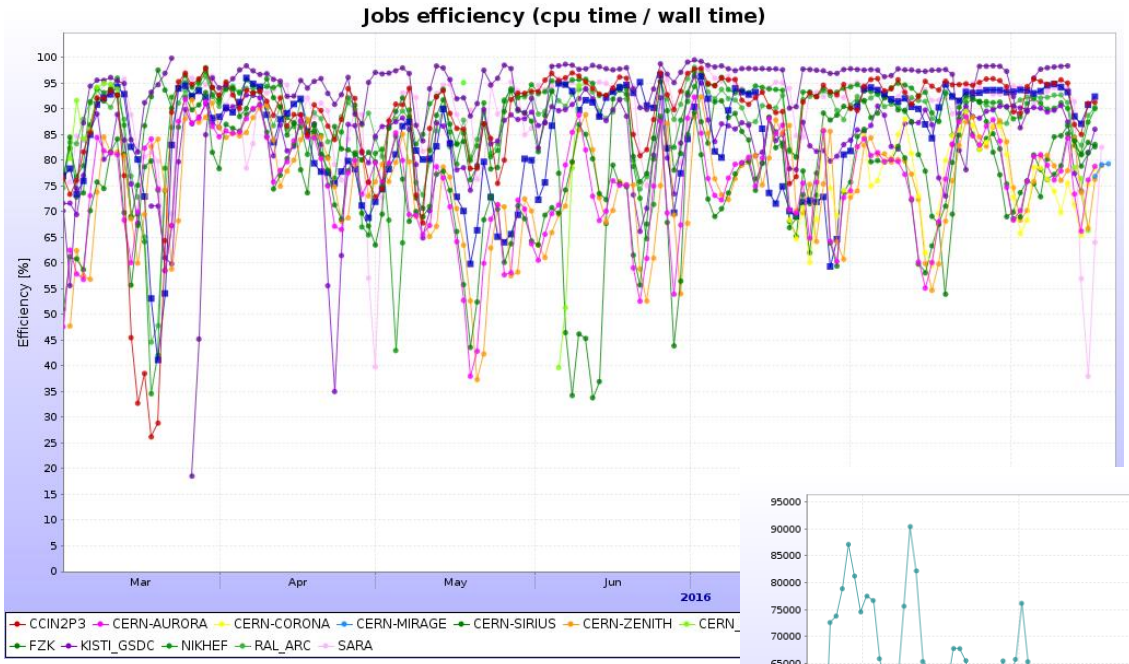
- Larger than expected Space Point distortions in the TPC seen in Run2 via tracking observables (Distance of Closest Approach to primary vertex)
- Implemented time dependent calibration procedure to correct the distortions
  - Similar to what was foreseen for Run3
  - Use inner (ITS) and outer (TRD, TOF) detectors
  - 3D distortion vector for each TPC voxel
  - Smooth parameterization used in reconstruction
- Re-processing of 2015 data with new software is almost completed
  - in parallel with reconstruction of data from the current run




DCArϕ vs TPC sector

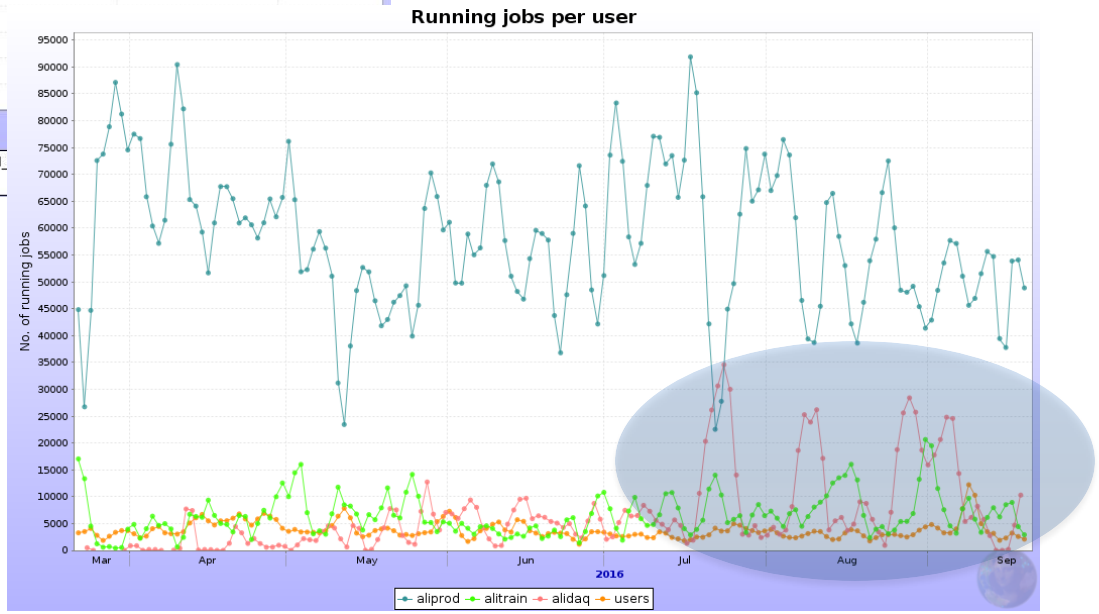


# ALICE Summary (3)




Efficiency better than 83%

- In spite of increased share of I/O intensive reconstruction jobs the average job efficiency remains high on most of T1 sites



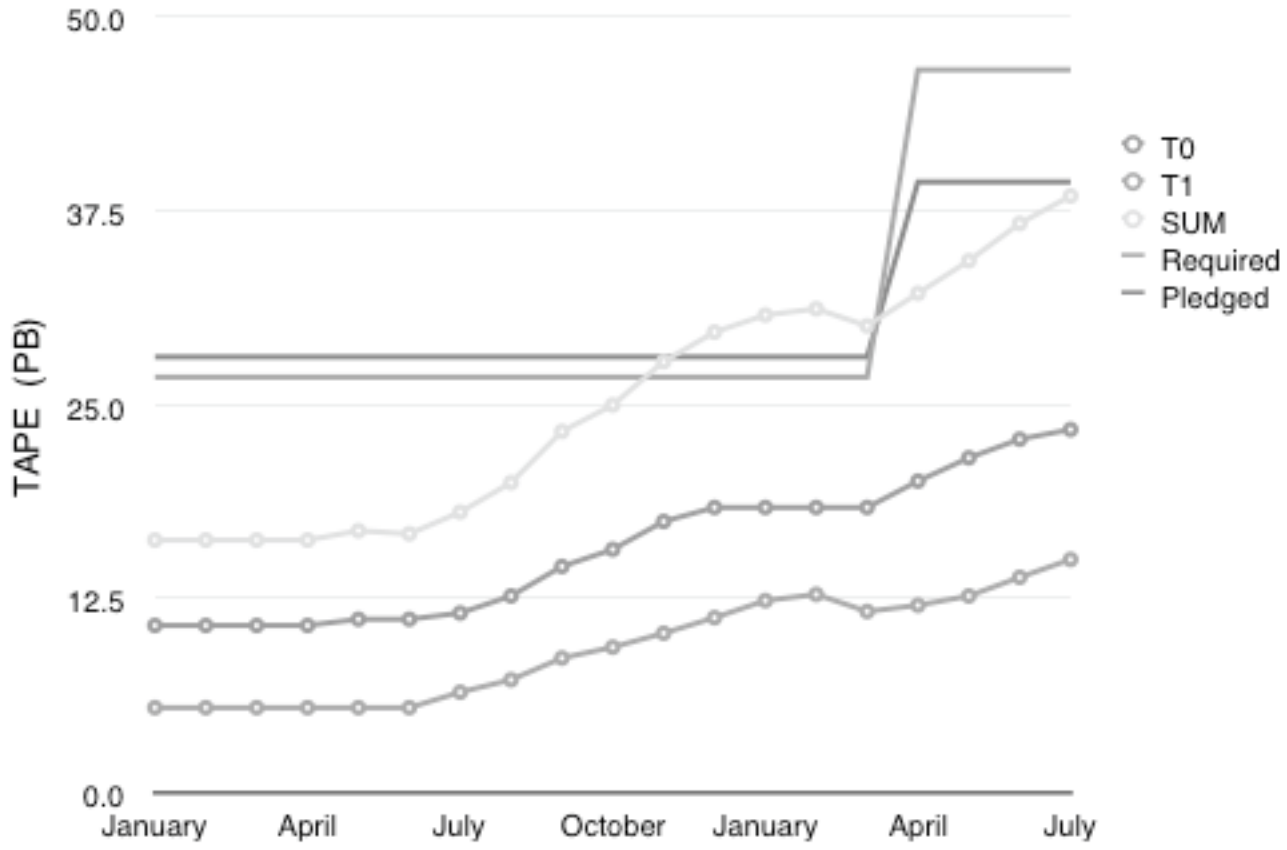



Figure 4. *Profile of tape usage in 2015-2016*

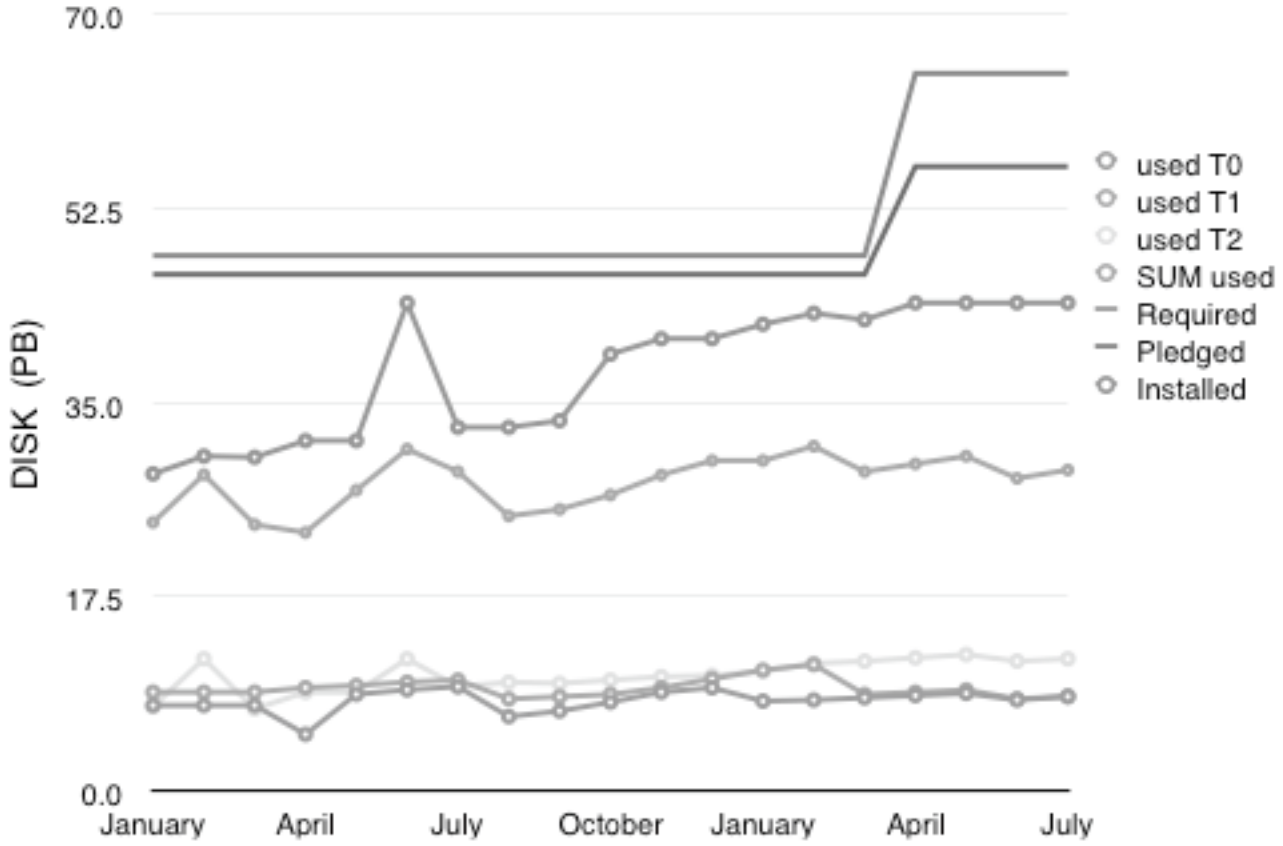



Fig 5. *Profile of disk usage in 2015-2016.*

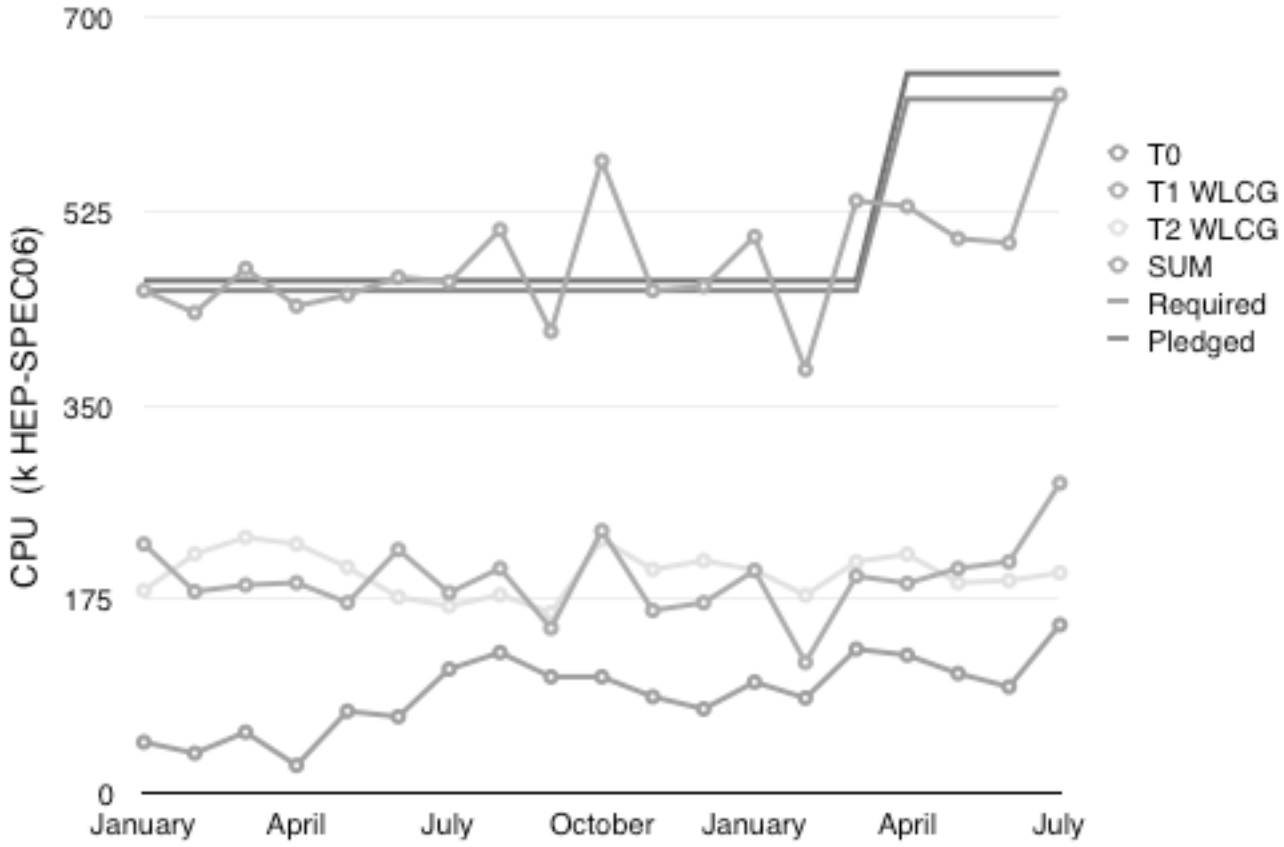



Figure 6. *Profile of CPU usage in 2015-2016.*