Time stability for the reference sensor - LGA35

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On behalf of IHEP group
Test Beam Analysis meeting - 17/01/2019

IHEP

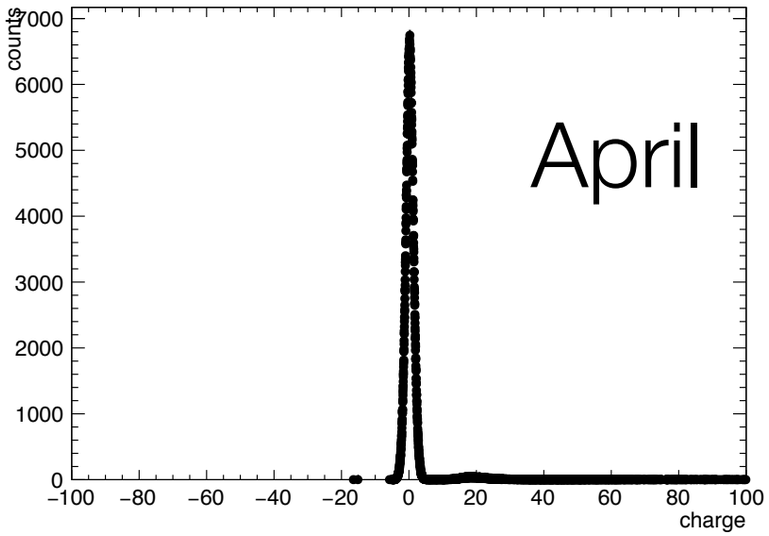
Overview

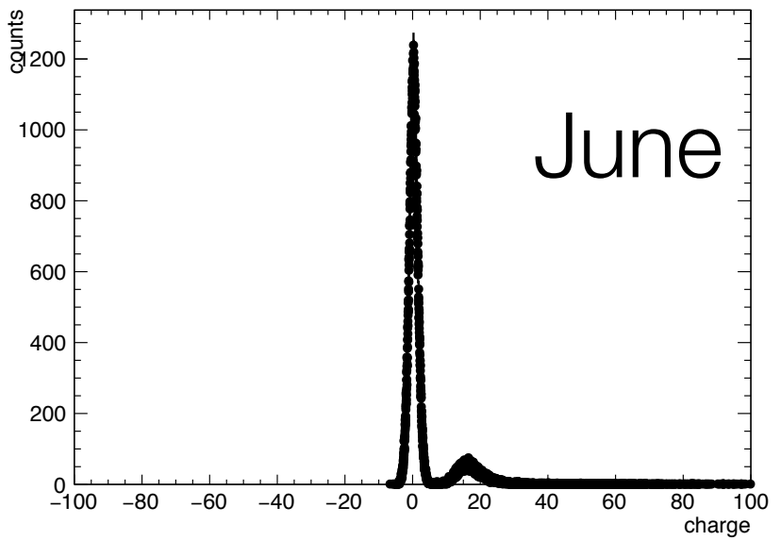
- Goal:
  - Study the performance time stability reference sensor LGA35
    - Used in all 2018 test beam campaigns
- Data used:
  - Oscilloscope data from April, June, September and October test beams

Some technicalities

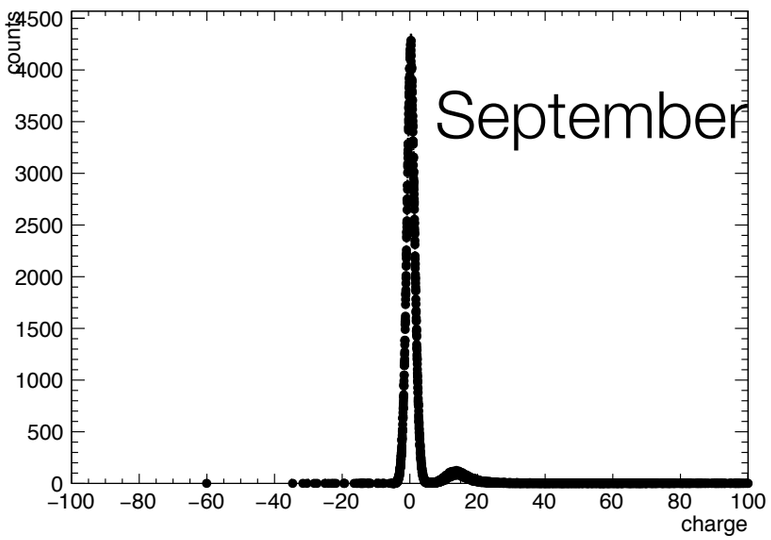
- Copied the data to my eos storage space
  - Data produced by PyAna framework (thanks to Nikola)
  - /eos/atlas/user/m/mayoub/HGTD-TestBeam-Files
- For each test beam campaign
  - Merge all the runs with the same configuration into one batch
  - Reducing the number of runs (or root files) for simplicity
- Plotting and fitting
  - Using standalone scripts to get the variables, plot, fit,…

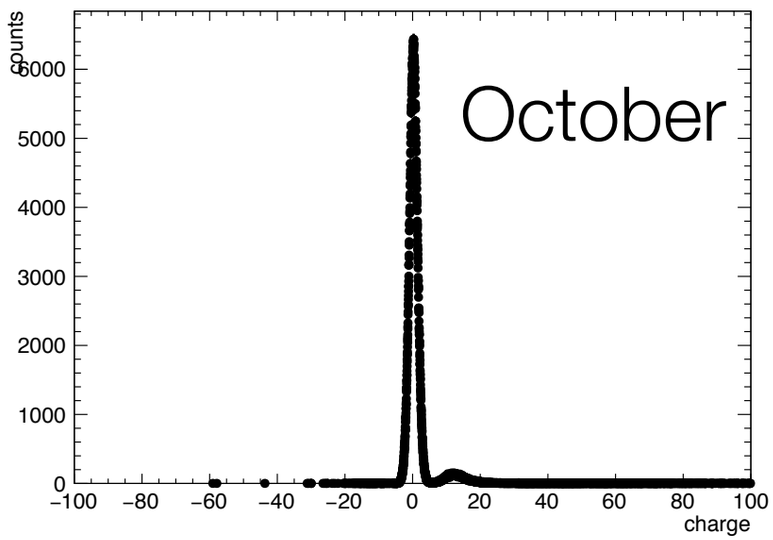
Charge distribution (1)





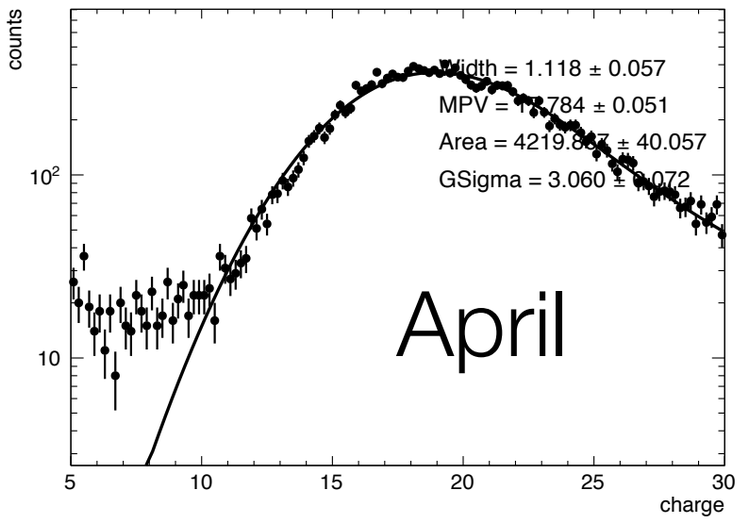
- Clear separation between noise and signal peaks
- Dont do a cut on DeltaT to select the signal

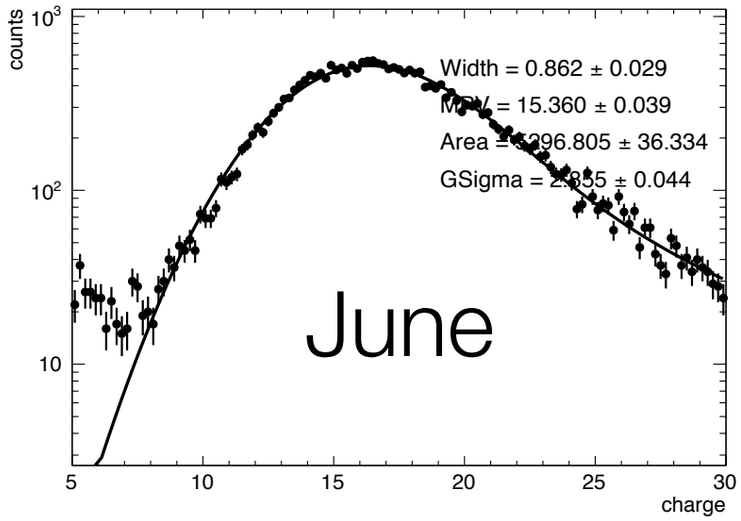


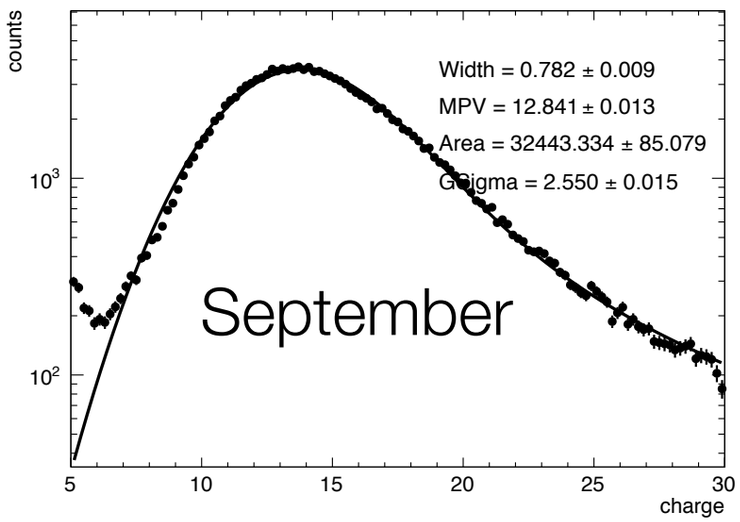


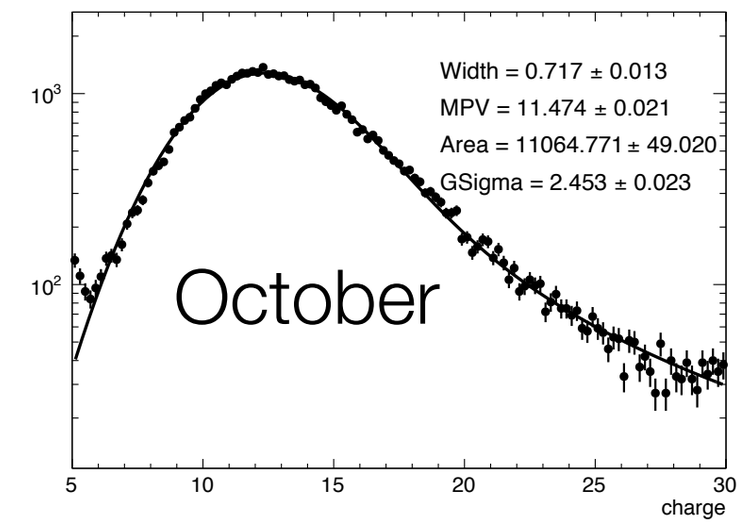
- Simply cut the noise and fit the range of the signal peak

Fit distributions





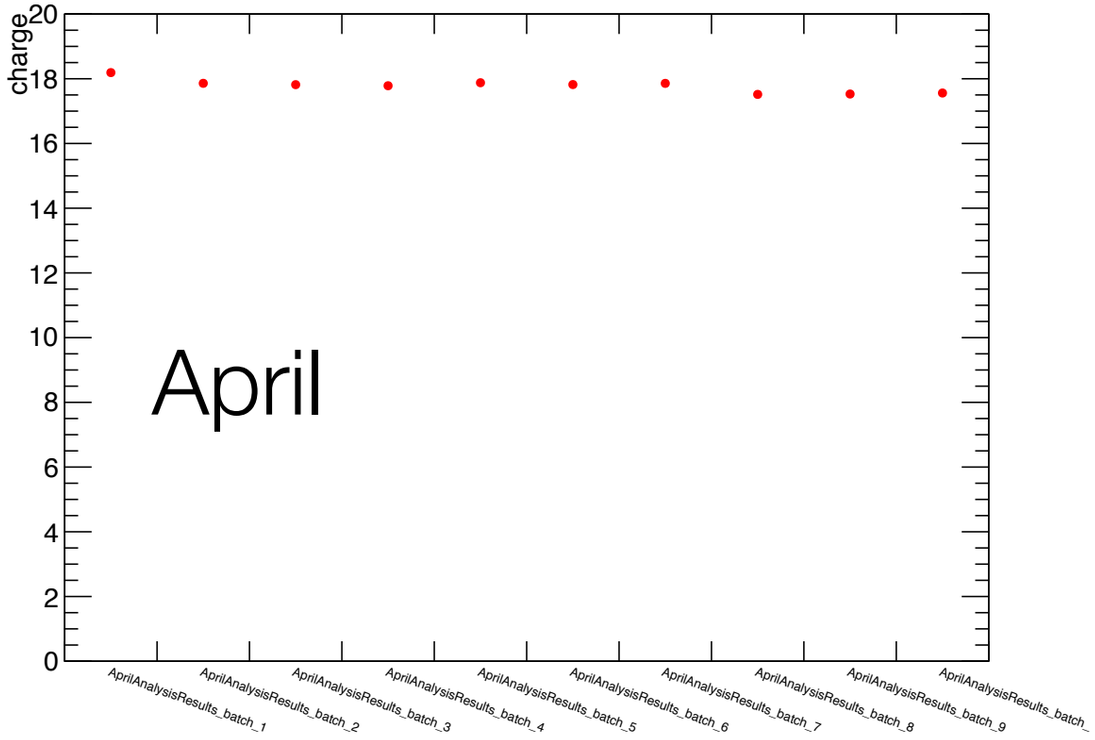




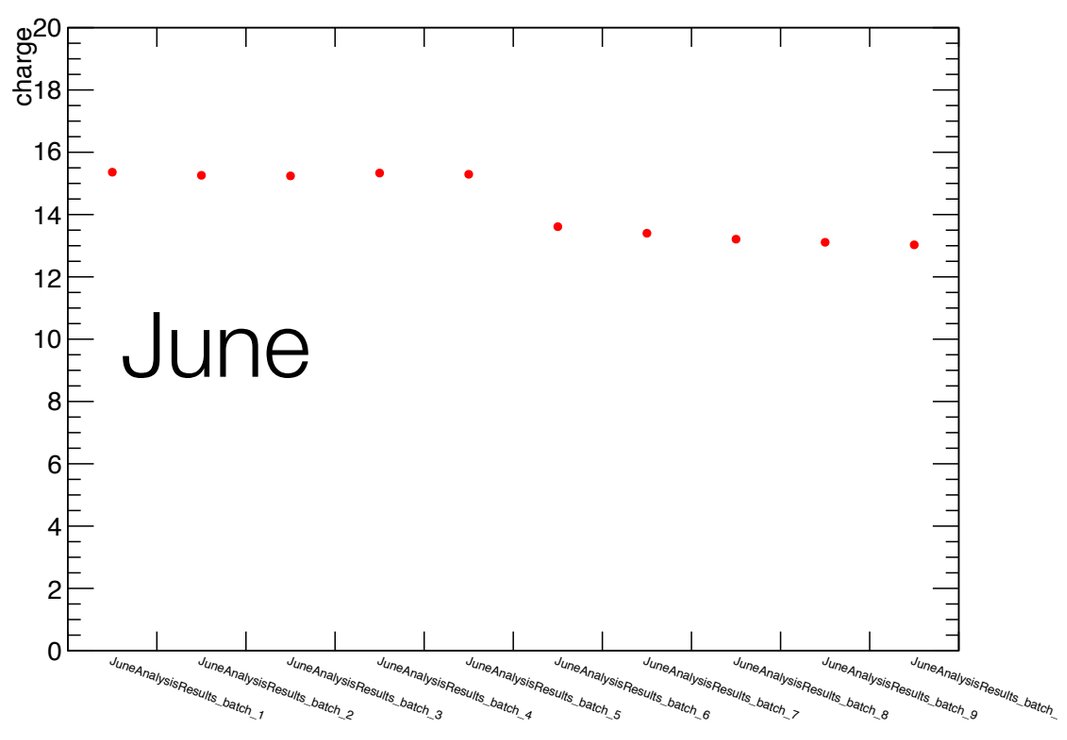
- Using Gaussian fit convoluted with Landau

Charge per batch/campaign (1)

Charge

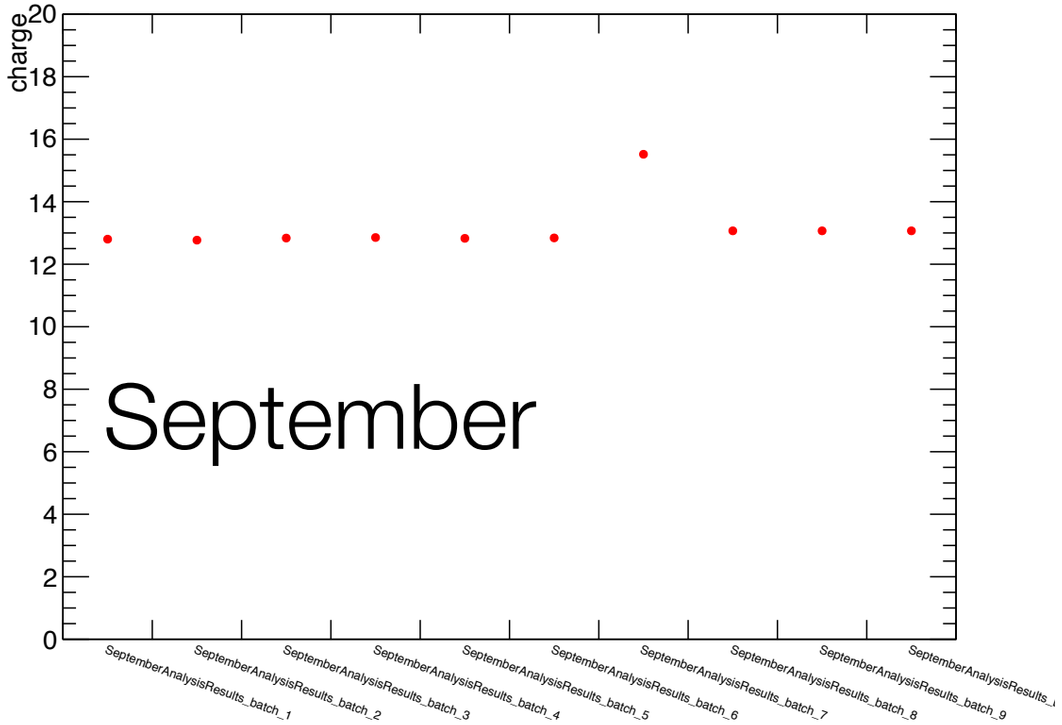


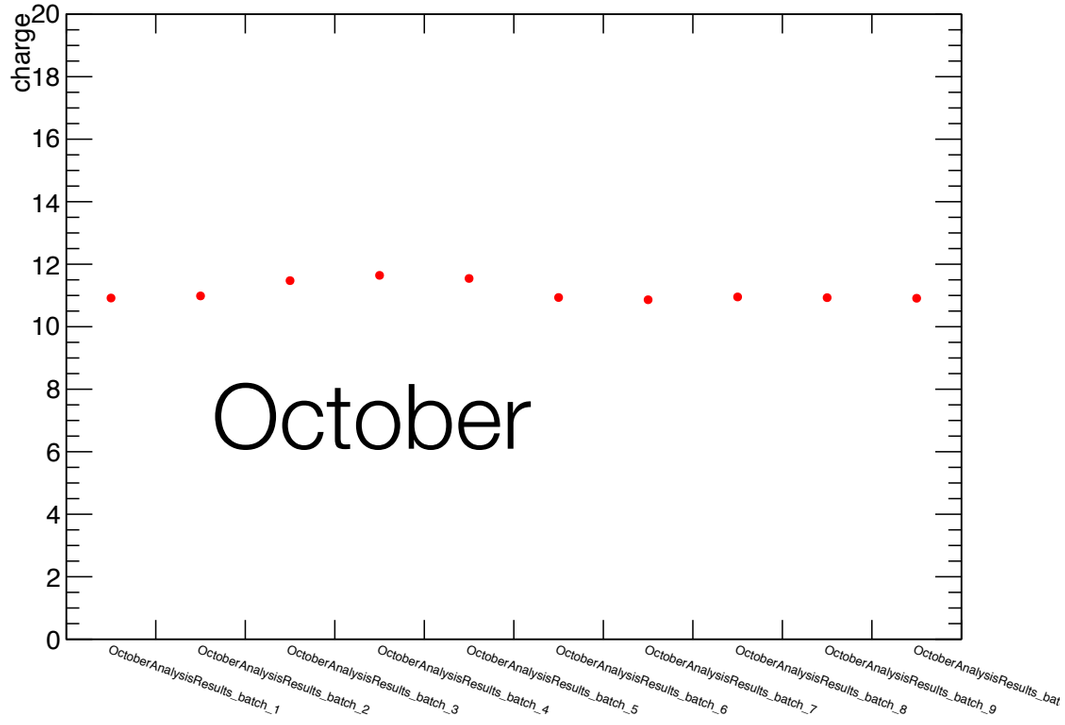
Charge



- Stable charge value along the batches
  - Drop for June at batch 6 (temperature changed from -20 to -30)

Charge per batch/campaign (2)

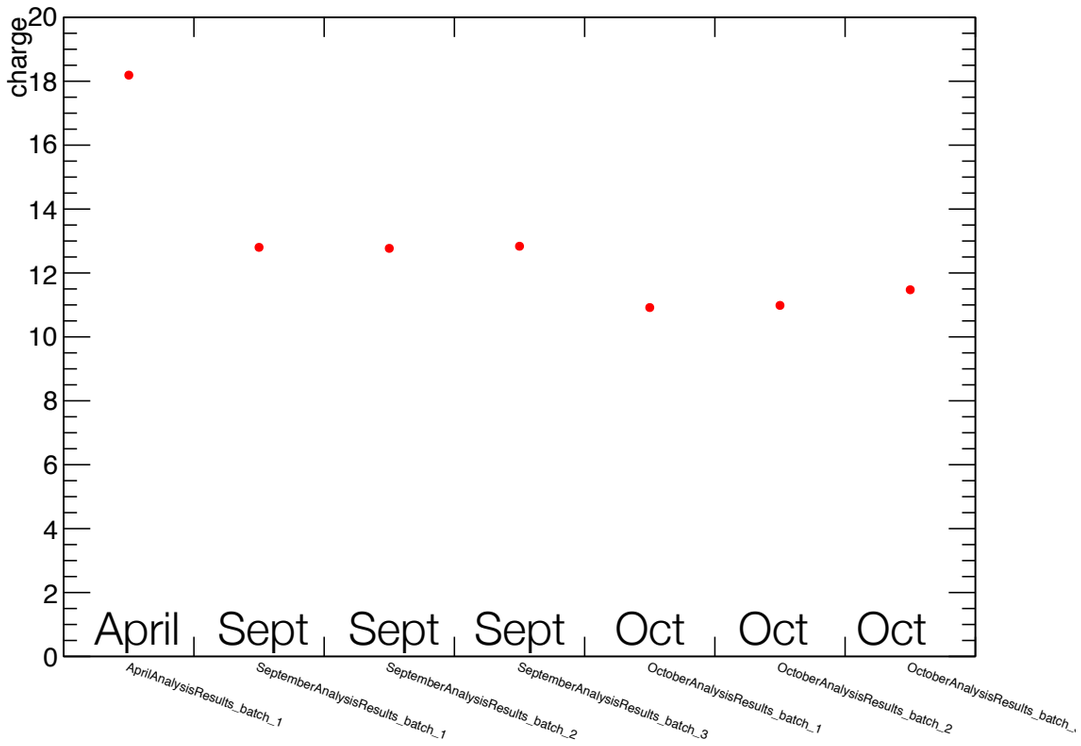




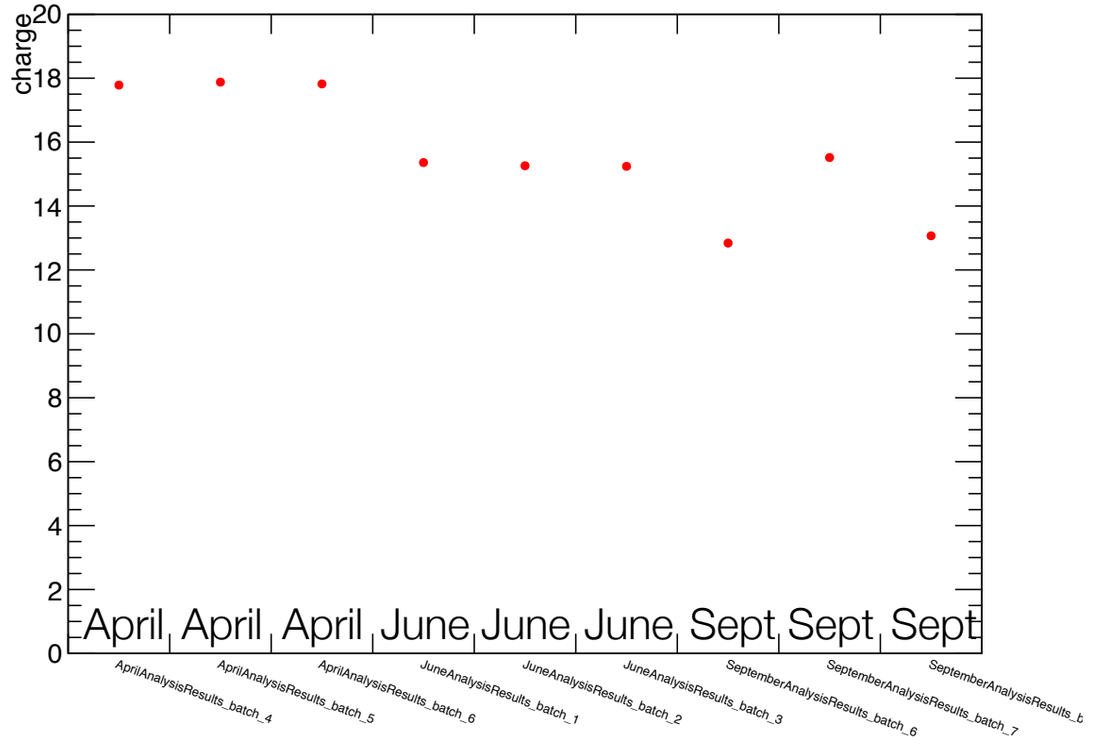
- Stable charge value along the batches
  - Except one batch for September?

Charge - compare different campaigns

HV = 180V (@-30)



HV = 200V (@-30)



- Some decrease of the charge with the time
  - Getting lower with the newer campaigns