

# April 3, 2025

Qingyuan Liu

## ■ Recent progress

- Using old/new **templates to fit ECL trigger rates** in **November study**
  - Reinvented the wheel
    - Use pandas to handle PV values and fit the data with two methods: least-square and maximum poisson likelihood
    - For easier comparison of different fitting scenarios
    - Prepare for general PV analysis
  - Short summary on results
    - New templates (2024) seem to **overestimate** LER beam-gas
- **SAD code development**
  - Finished conceptual design to use Geant4 to modify coordinates of beam particles
    - **ExternalMap** for customized collimation
    - **System-interface** for communication between SAD and Geant4
  - Possible application:
    - Simulation of beam interaction with dust particles
    - More realistic collimator for both rings
      - Tip scattering is only implemented for SKB type collimators
- SAD simulation to scan head length of **D05V1 with CFC** (Carbon Fiber Composite)

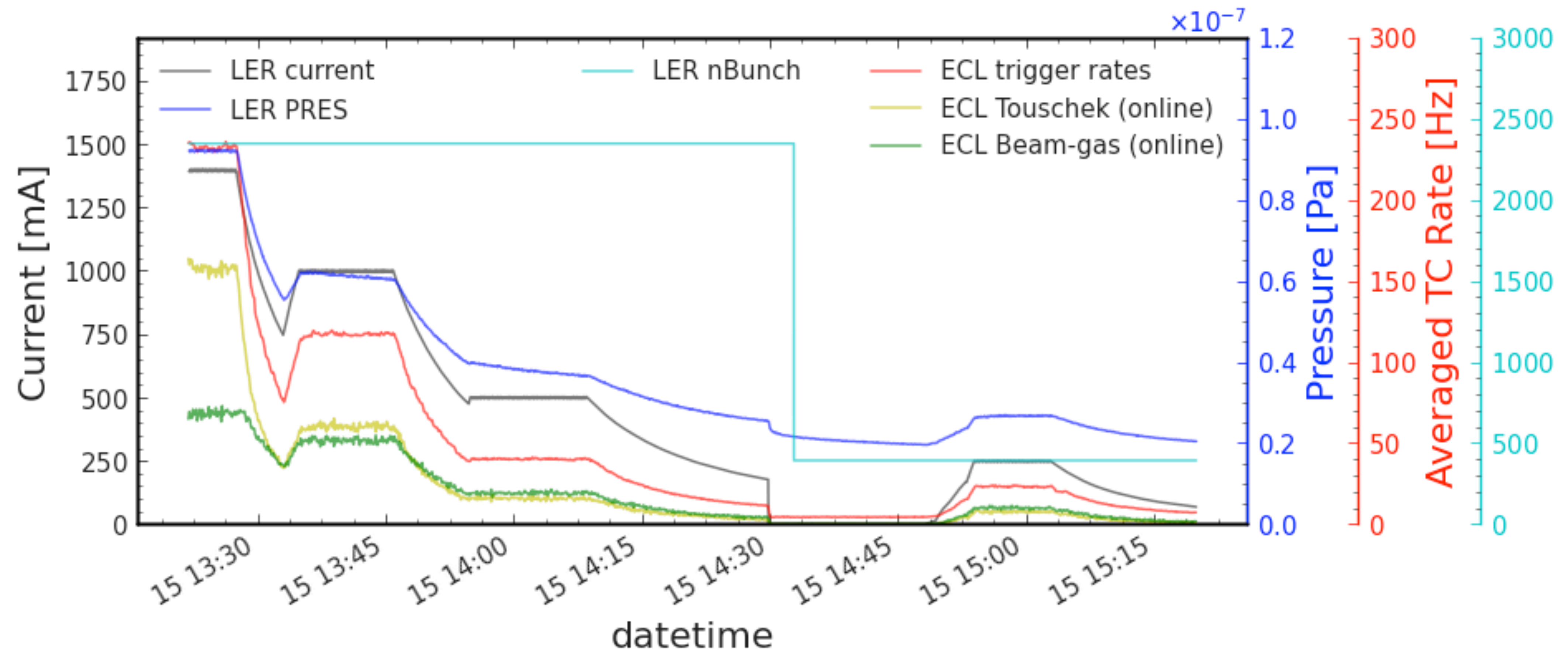
## ■ Plans for the next week(s)

- Remind KLM expert to investigate the zero hit rate for end-caps in the April MC. -> Major blocker to completing data-MC study for April
  - There are a lot of SimHits in EKLM
- ECL trigger rate fit: The Touschek template derived from relatively low stat limits the fit quality!
  - Generate more MC for November, Implement outlier removal and check if a particular component follows measured tune shift.

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■ November study

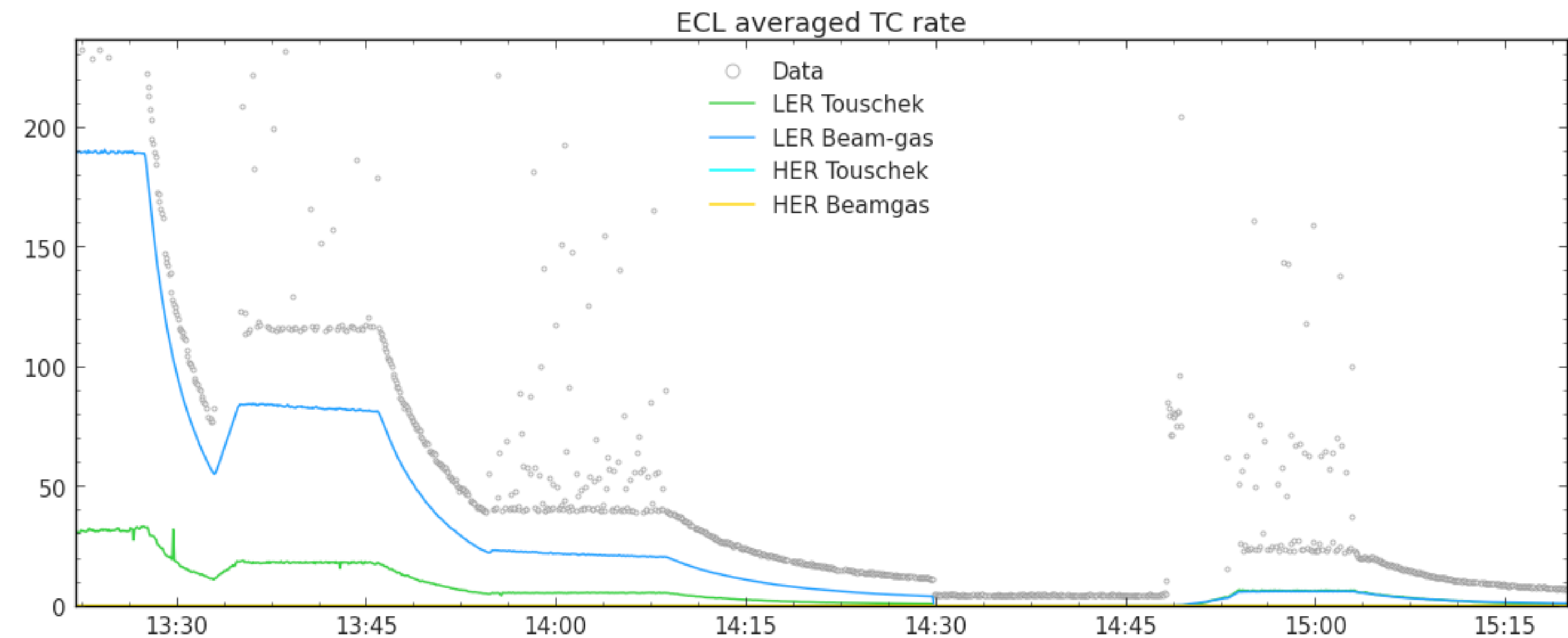
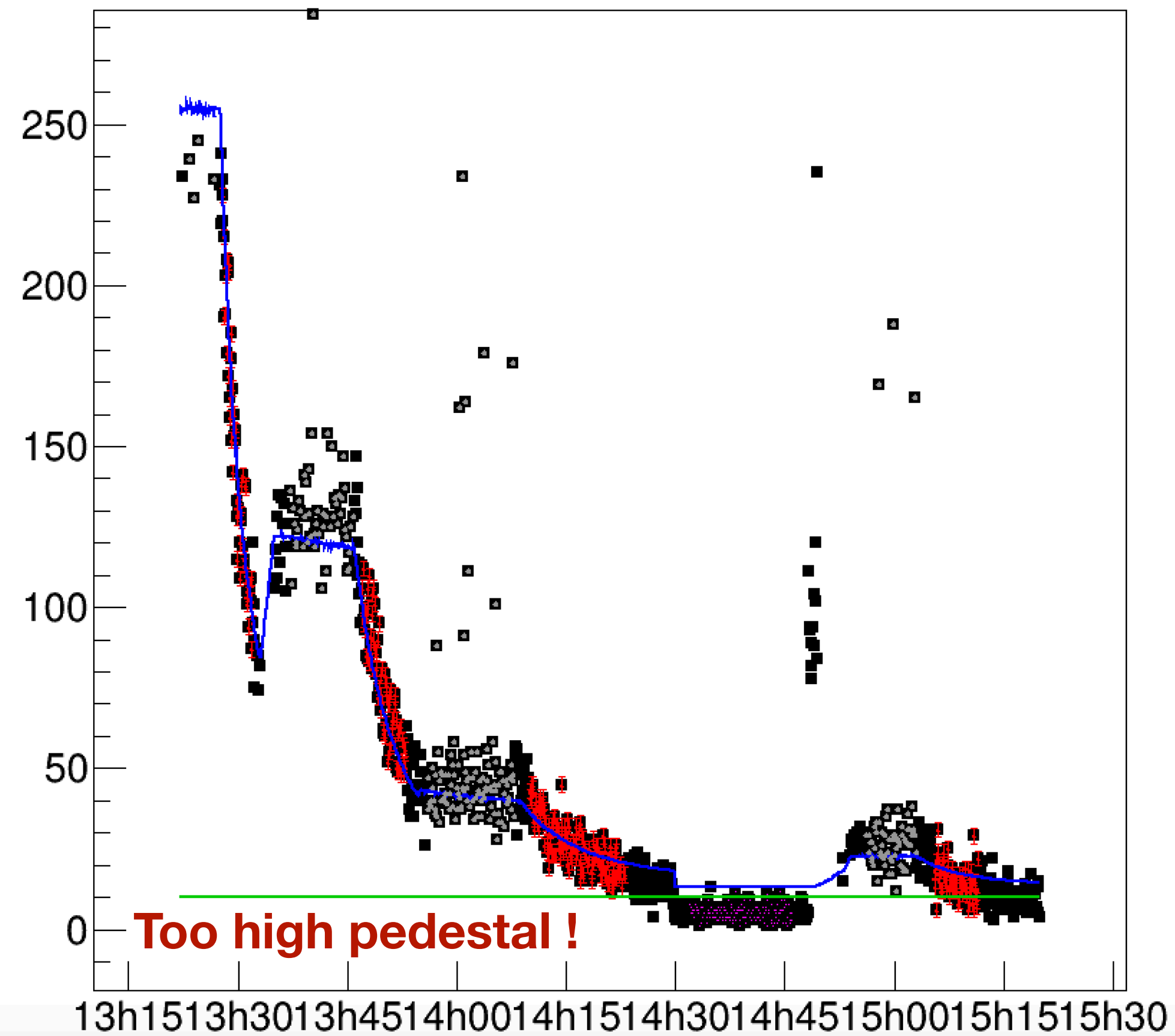


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- Heuristic fit doesn't work very well?

tcid\_99



**Super high Beam-gas component !**

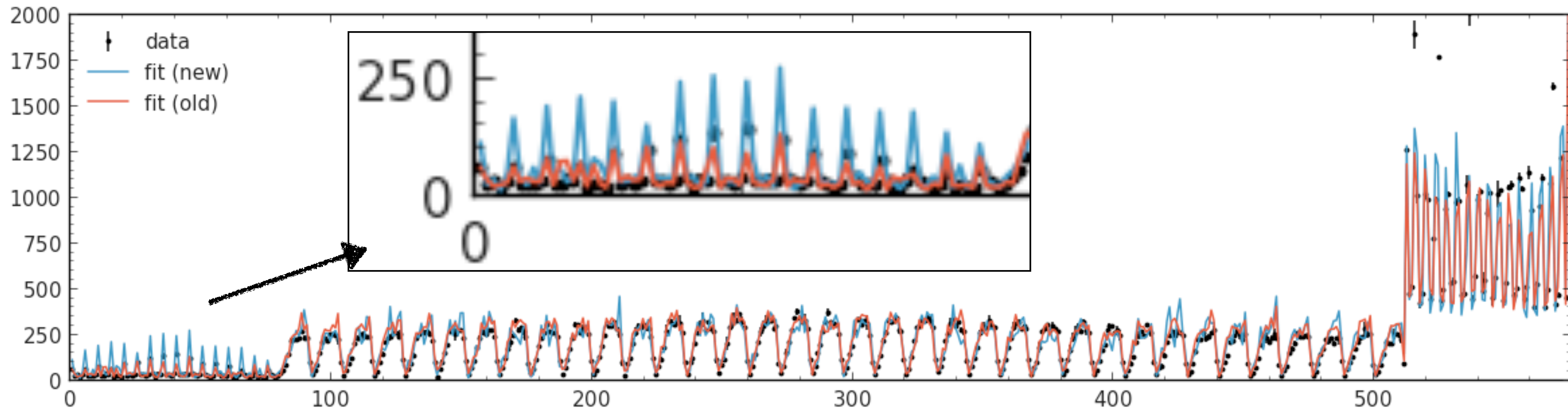


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## ■ Fit example

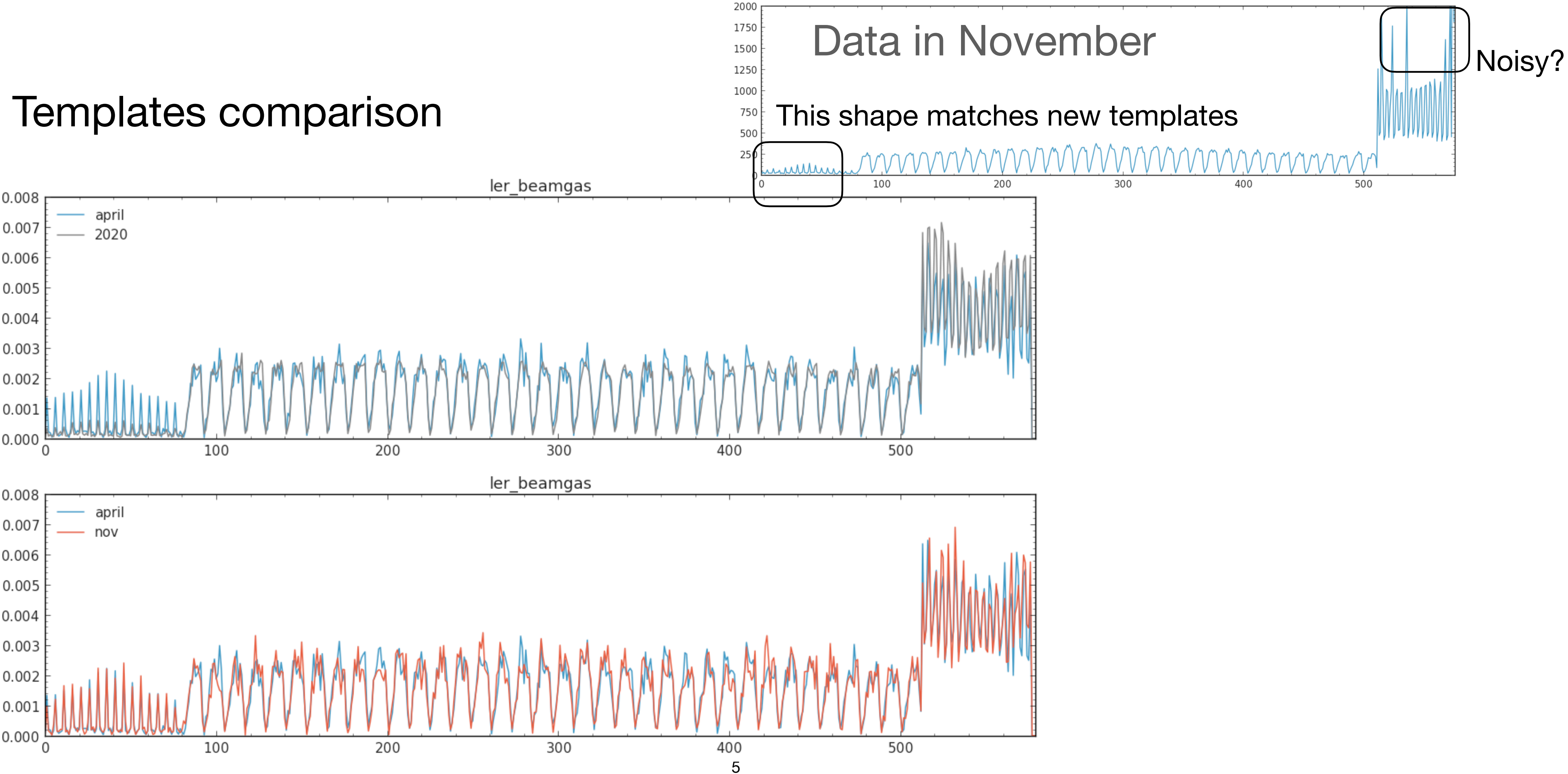
- $\text{chi2}(\text{new}) > \text{chi2}(\text{old})$



beamgas/touschek(new):	1.90
beamgas/touschek(old):	0.35

# Work in progress: ECL data fit with new templates

## ■ Templates comparison





# Work in progress: ECL data fit with new templates

## ■ Templates comparison

