

LTCC Updates and Status

Electrons and pions efficiency for Spring 2019
Status of Calibration

LTCC Configurations

- Run group A, K Fall 2018:

- Central detector shifted 30 mm upstream
- target (LH2) at (1.2, 1.1, -30) mm
- HTCC shifted 20 mm upstream
- FT On configuration
- FMT not present
- LTCC sectors: 3 (50% C4F10), 5 (N2)
- Torus polarity: -1, 1,
- Solenoid polarity: -1
- Beam Current: from 5 to 75 nA

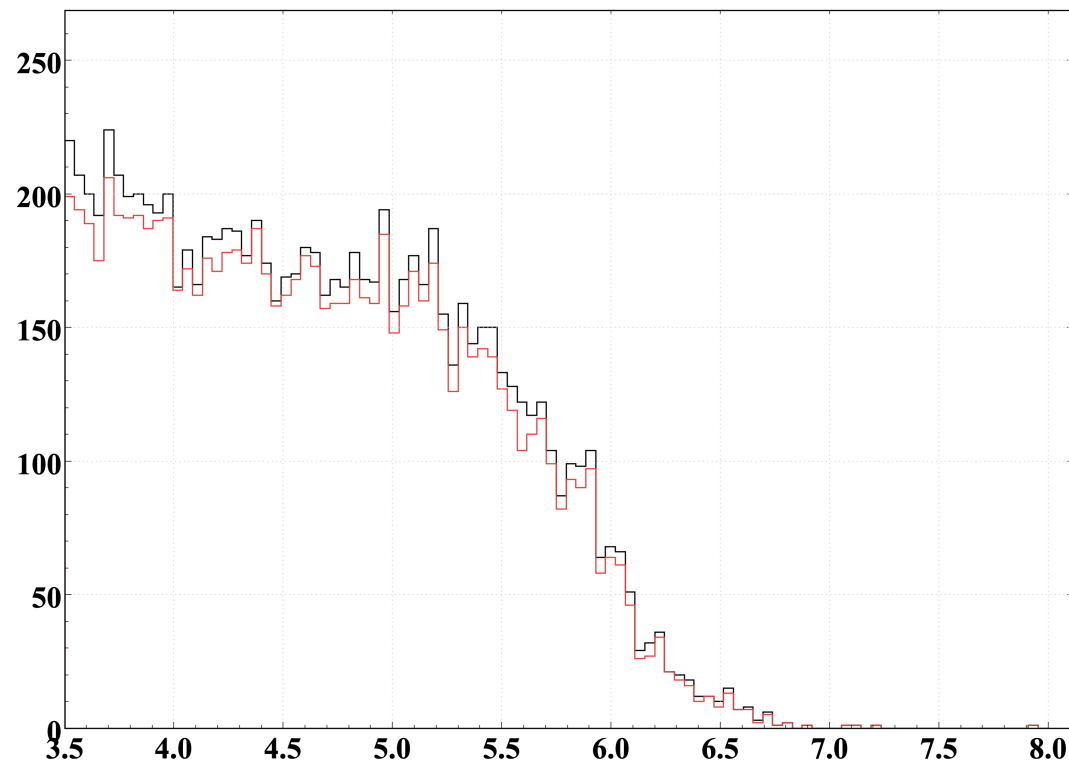
**sector 3 only 1/2 full
gas not purified**

- Run group A Spring 2019:

- Central detector shifted 30 mm upstream
- target (LH2) at (1.2, 1.1, -30) mm
- HTCC shifted 20 mm upstream
- FT On configuration
- FMT not present
- LTCC sectors: 3 (C4F10), 5 (C4F10)
- Torus polarity: -1,
- Solenoid polarity: -1
- Beam Current: from 5 to 75 nA

**sector 3, 5 are full
gas not purified
data is uncalibrated**

LTCC Electron Efficiency

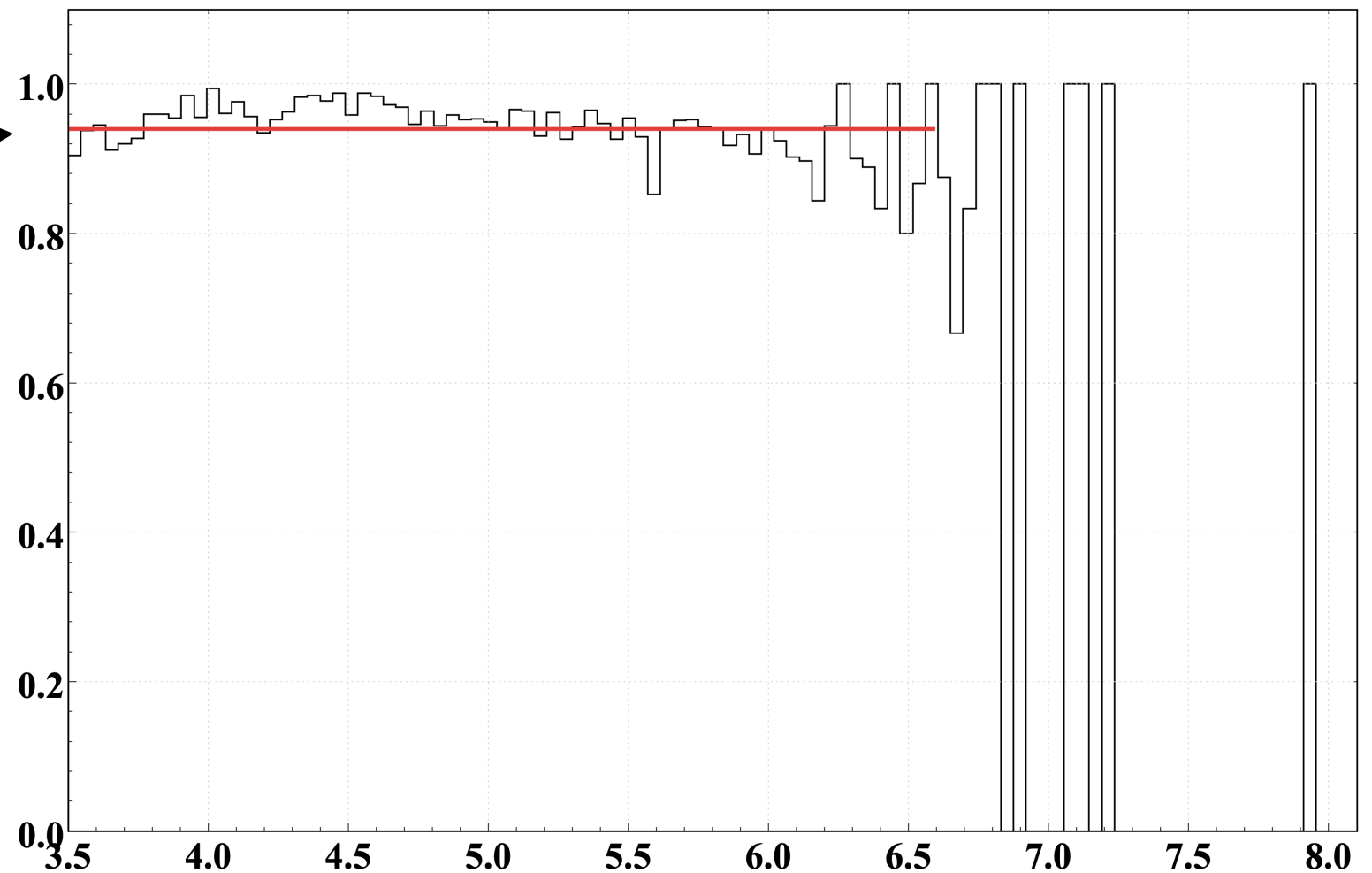


- Electrons momentum selected in the expected pion response range;
- Electrons identified using the reconstruction event builder algorithm (no extra EC cuts);
- Electrons must be within a fiducial volume of the LTCC.

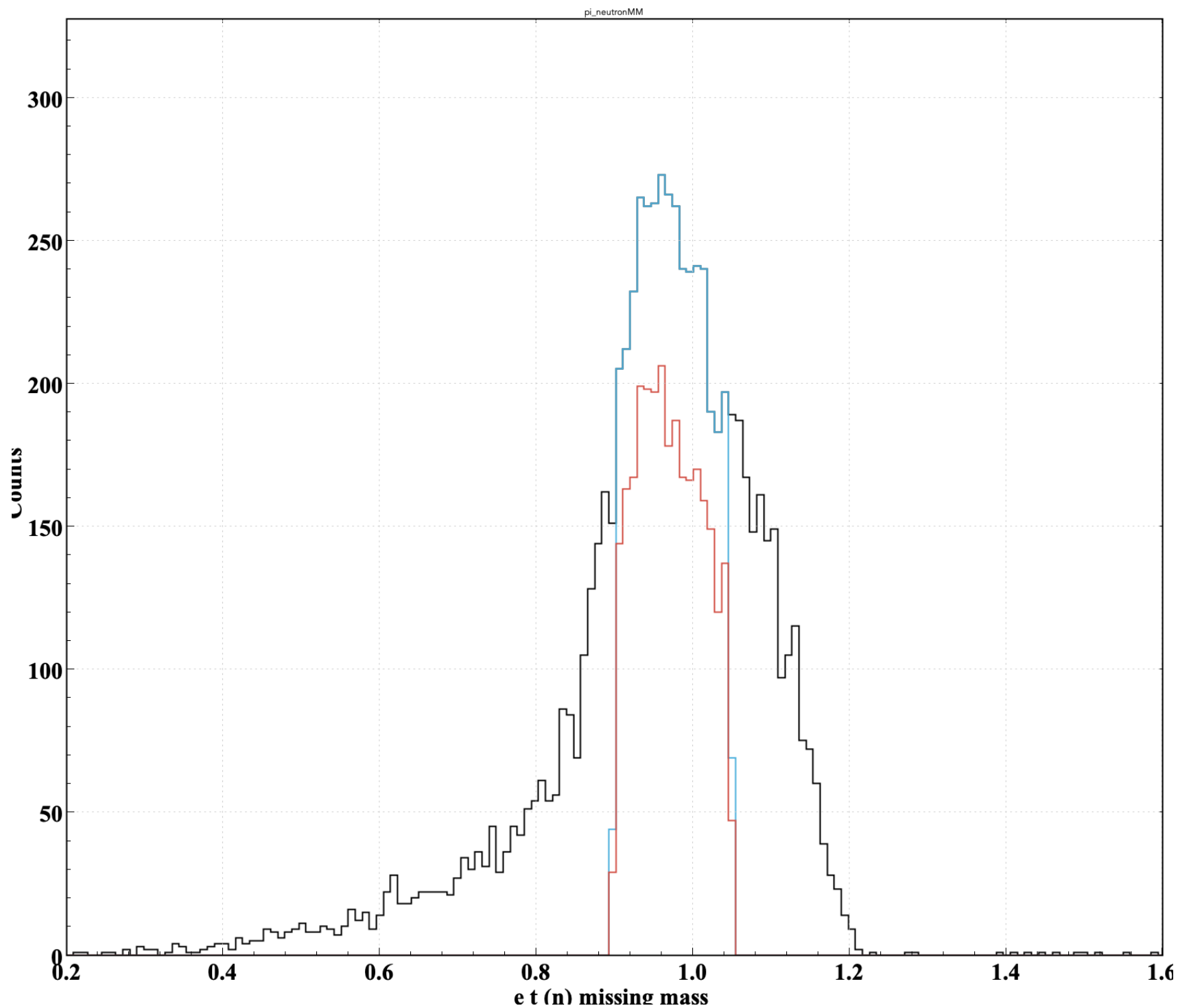
94%

Not 99%. Maybe due to:

- uncalibrated data
- no extra EC cut
- not pure gas
- other systems inefficiencies



LTCC Pion Efficiency

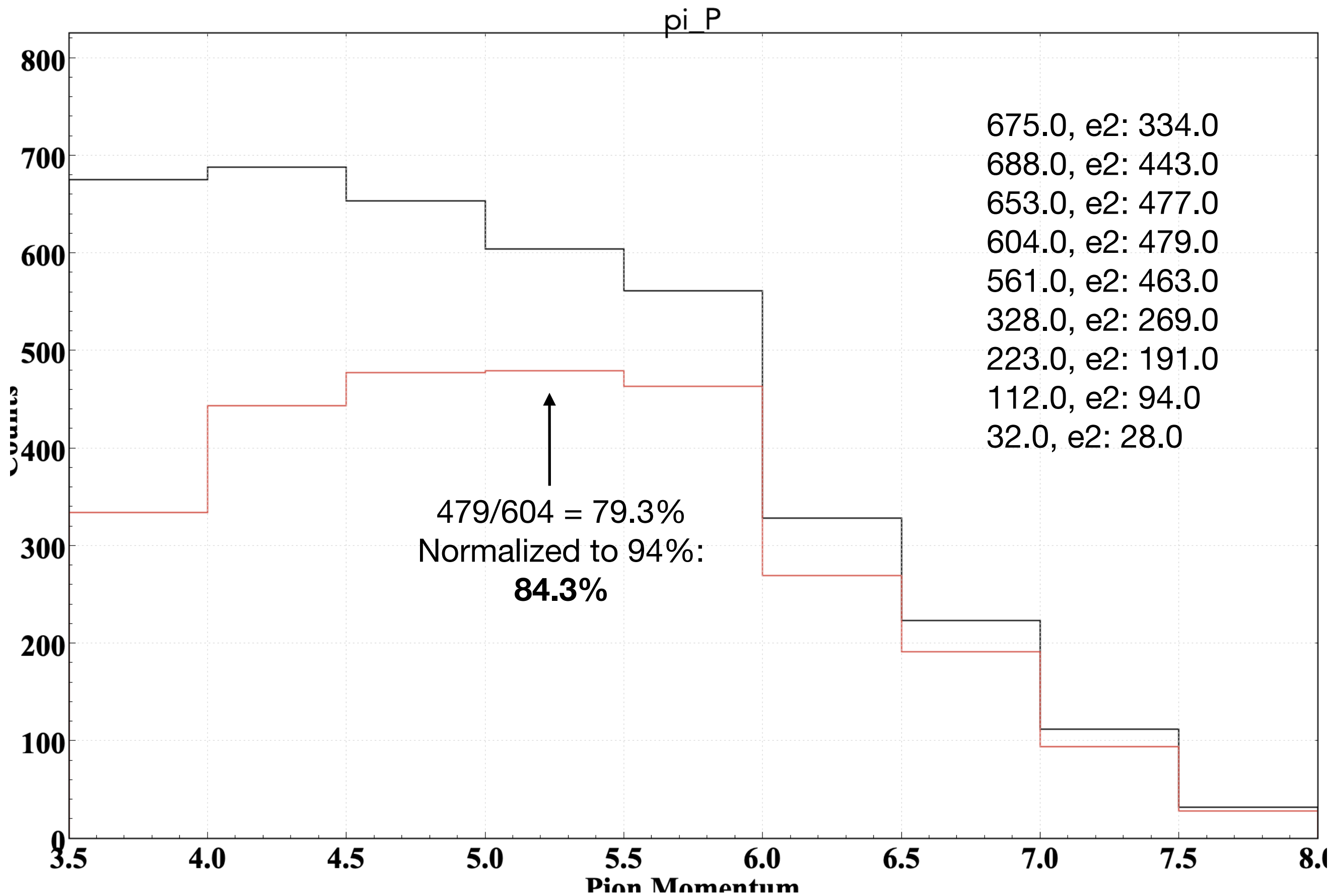


$$e P \rightarrow e' \pi^+ + n$$

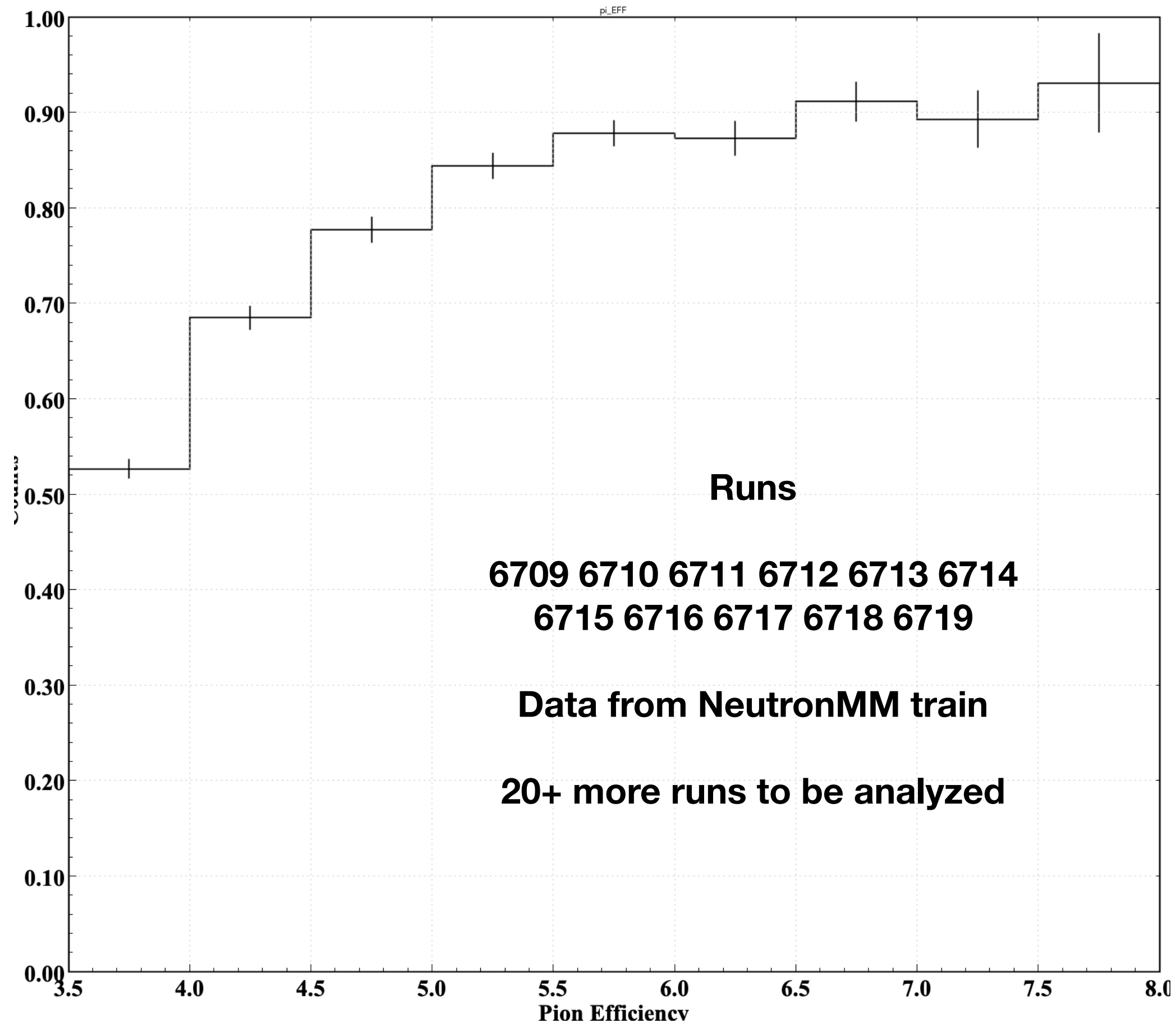
- electron selection
- positive tracks candidates within the fiducial volume
- neutron missing mass cut:

$$0.95 < mm < 1.05$$

LTCC Pion Efficiency



LTCC Pion Efficiency



Status of Calibration

2018 Calibrated runs:

3422
3820
4013
4301
4781
5036
5700
5893

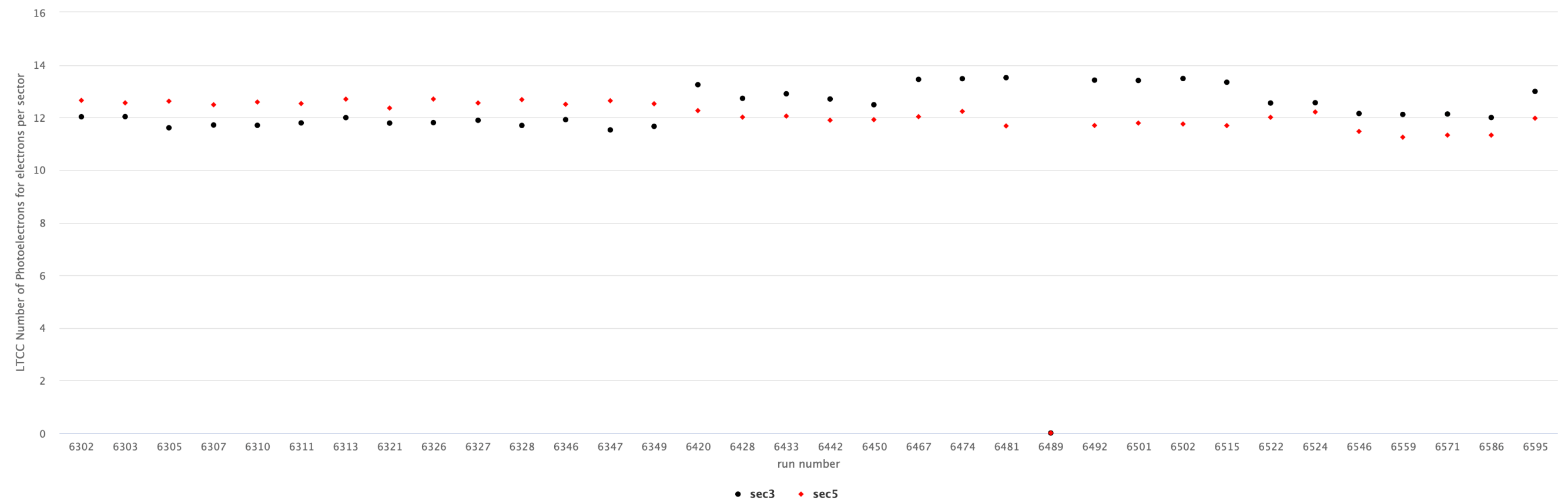
2019 Calibrated runs:

6200	6595
6201	6609
6213	6631
6380	6672
6467	6698
6522	6765
6591	

Calibration in
collaboration with
INFN Brescia

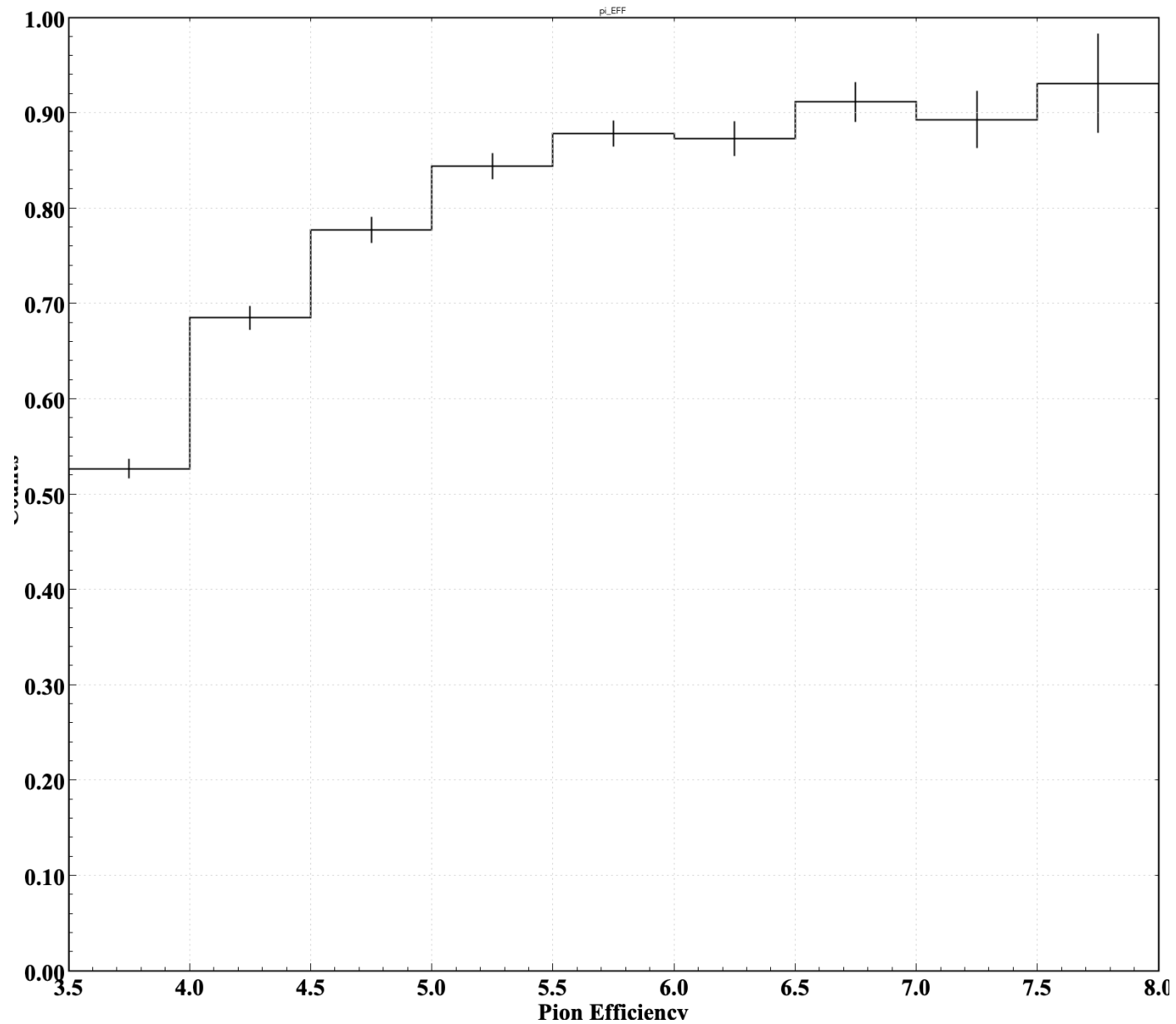
Valerio Mascagna

LTCC Number of Photoelectrons for electrons



Remaining issues: timing calibration, improved reconstruction matching with LTCC

Conclusions



- Efficiency not as bad as originally thought.
- Calibration is under control.
- May want to consider use 100% pure gas for the next run (Bob would need to start the purification THIS WEEK)