Signal strength with neutron generator

ProtoDUNE-SP Operations

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Introduction

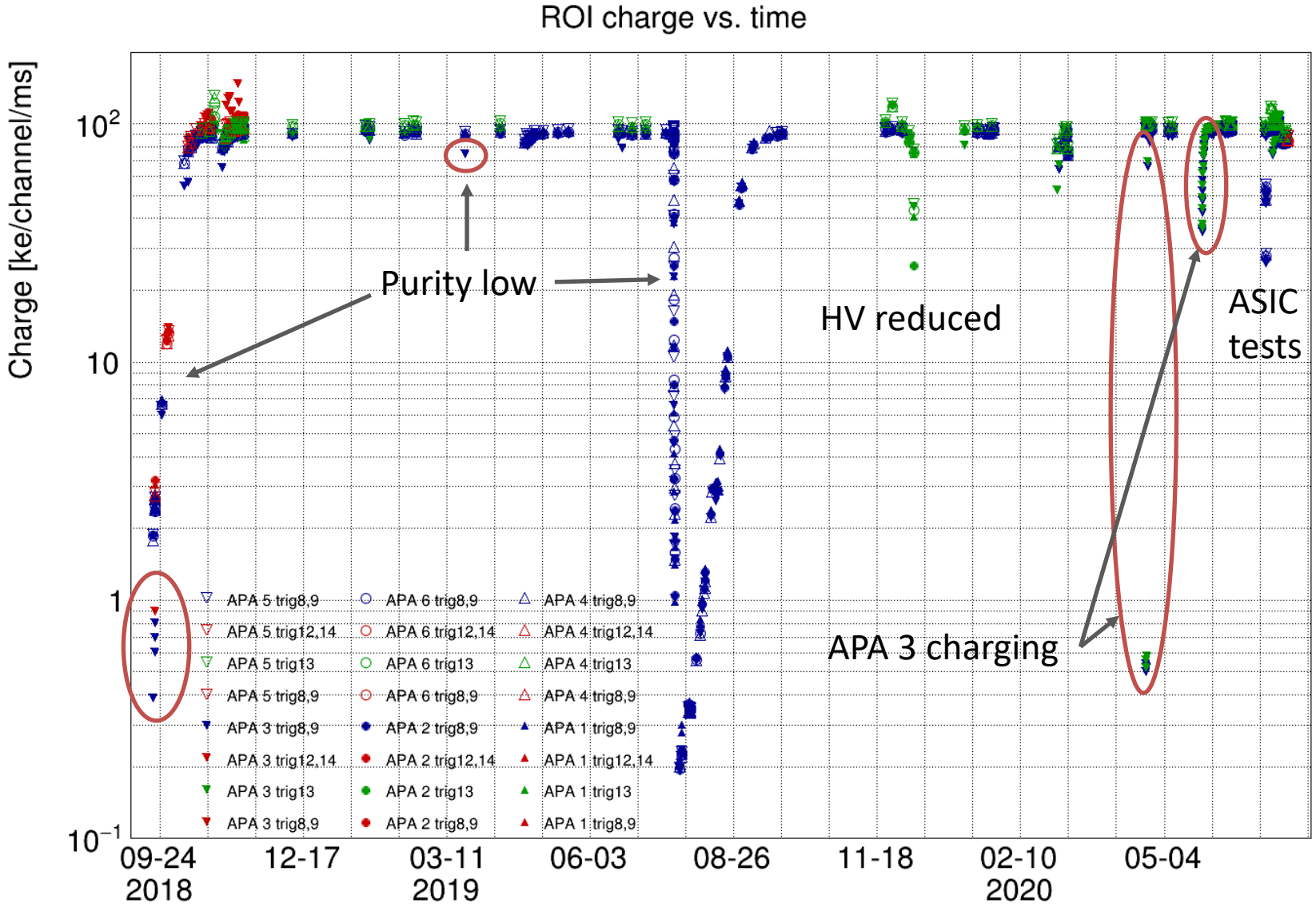
I continue monitor signal strength to recent data

- Can we see signals from neutron generator near APA 5?
- Include data through run 11672
  - After this, data not (yet) copied to FNAL presumably related to dcache intervention on Wednesday

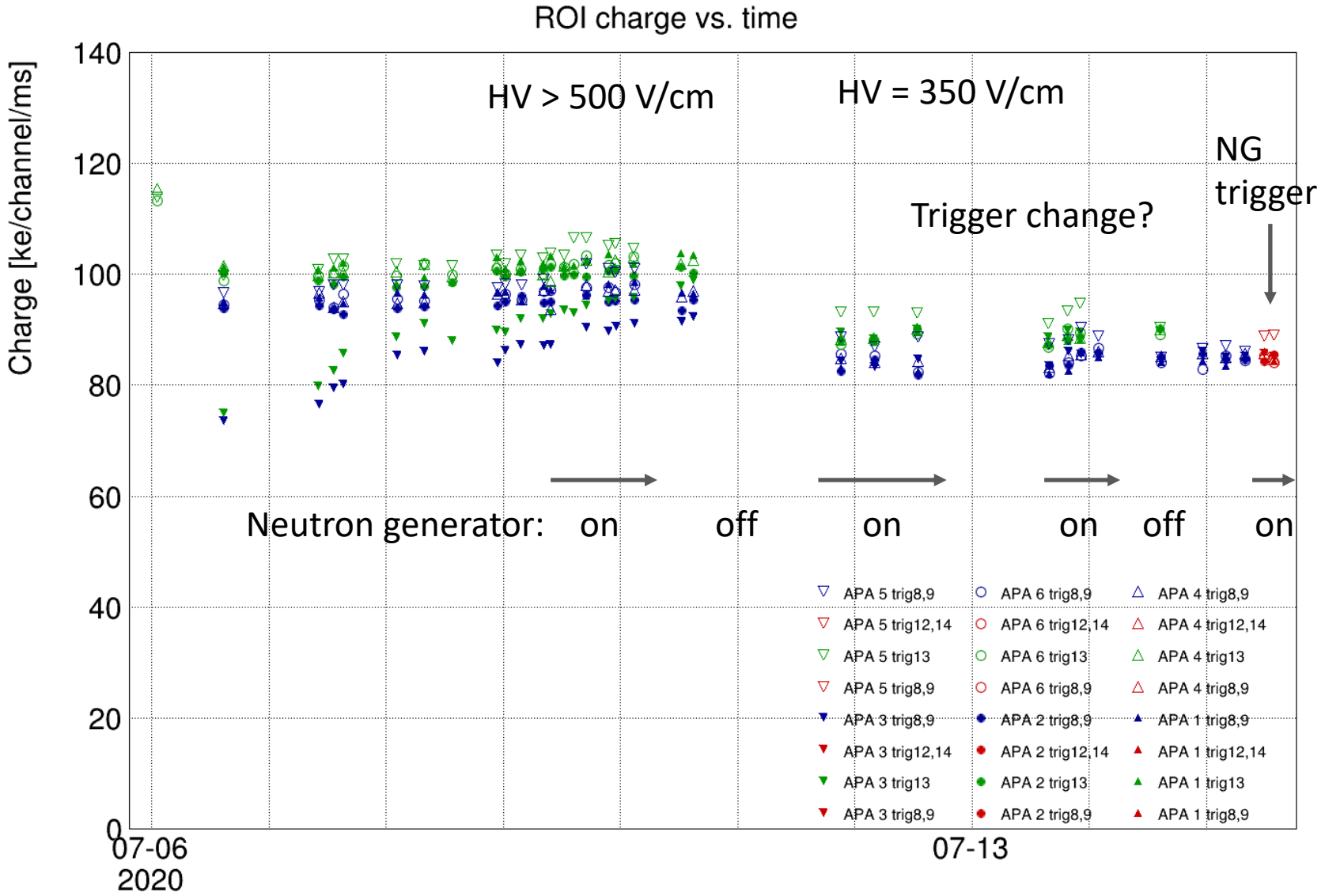
The following and other SS plots on the monitoring page

- https://internal.dunescience.org/people/dladams/protodune/monitoring
- These are updated as data is processed

Signal strength for full run



Recent signal strength



Neutron generator comments

Neutron generator

- New data confirm the neutron generator does increase the signal
  - (Run 11621 now understood to start w/o NG)
- Data shows an increase of ~2 ke/ms/channel in APA 5
  - × (480 channels) = 1000 ke/ms in APA 5
  - With 6.1 MeV → 90 ke for each n + Ar40 → Ar41 + gamma, this corresponds to about 10 neutrons/ms (10 kHz)
    - 10X the prediction from Jingbo: 0.1% × (1 Mhz) = 1 kHz
- It was pointed out in the meeting that much of the energy excess may be due to gammas from the neutron source
  - These would contribute near the top of the detector