Discussion on Physics Performance goals for ProtoDUNE II

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DS meeting, 2021.08.31

Content

What are the DAQ Physics Performance goals for ProtoDUNE-II?

These are some **very first** thoughts.
I asked the question and there was no answer:
this is to start the discussion.
Please add, correct, etc.!

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I'll making notes in this presentation (slide notes in PP) and will upload that final version to DocDB.

ProtoDUNE-I

- Collection wire hit finding
  (FPGA, software, incl. ‘naïve’ induction wire hit finding)
- Online trigger
- Online monitoring of TP rate
  (very interesting for electron lifetime monitoring)
- Noise model
- Raw data files (for offline testing)

New in ProtoDUNE-II

ProtoDUNE-II

- 4 instead of 6 APAs
- Flipped APAs (electronics on bottom)
- Final components as much as possible
- Vertical Drift with ethernet R/O

ProtoDUNE-II DAQ

- New firmware (Induction wire hit finding)
- Software framework
- CCM/DQM
- Possible new Upstream DAQ HW (later? Ethernet for VD)

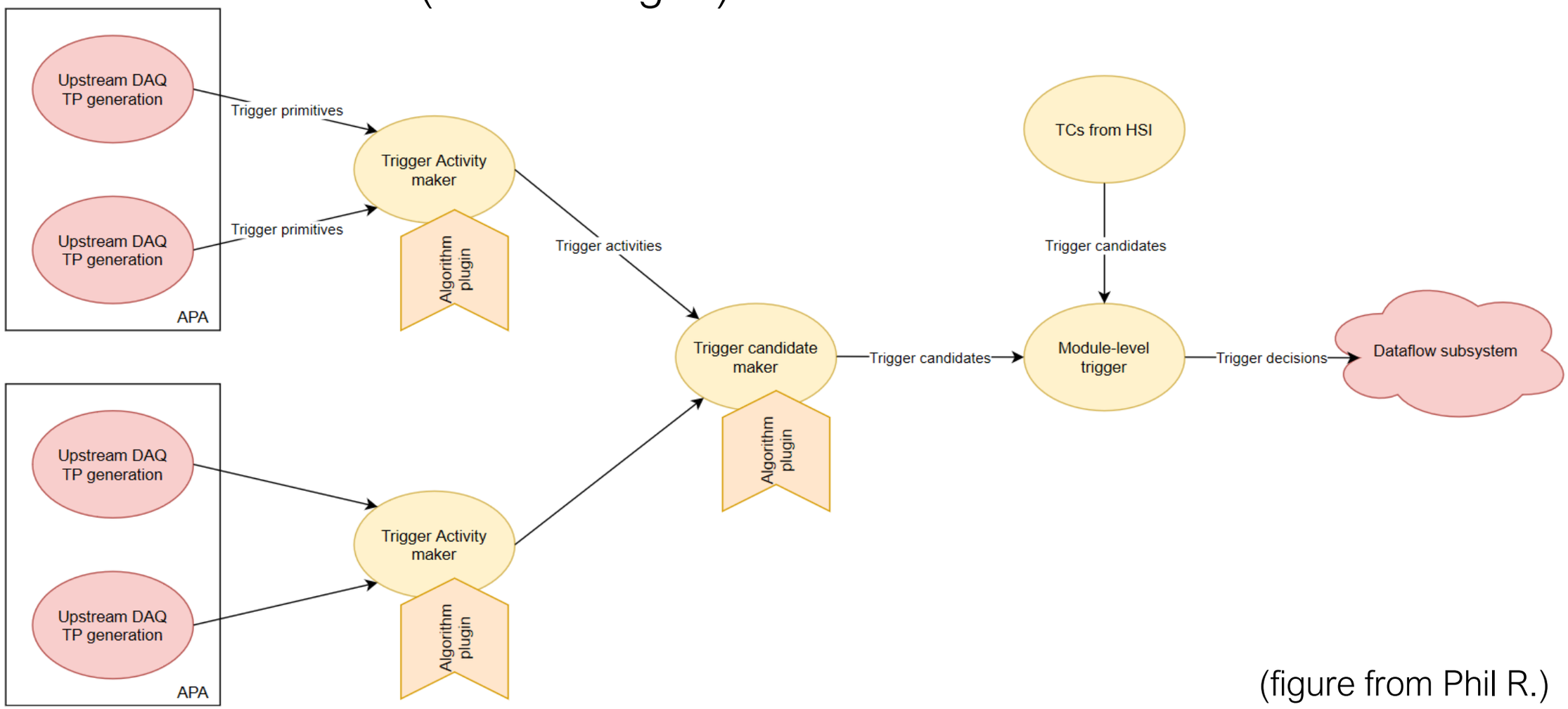
Further aims:

- PDS hit finding
- Combining collection/induction and collection/induction + PDS
- ROI

ProtoDUNE-II goals

DAQ (miniDAQ) performance (HD/VD)

- Verify performance TP, TA, TC algorithms(metric/method?)
- ^{39}Ar?
- Michel electrons (dE/dx range?)?



(figure from Phil R.)

ProtoDUNE-II goals

DAQ (miniDAQ) performance (HD/VD)

- Verify hit finding / clustering / trigger (metric/method?)
  - ^{39}Ar?
  - Michel electrons?
- ROI (metric/method?)

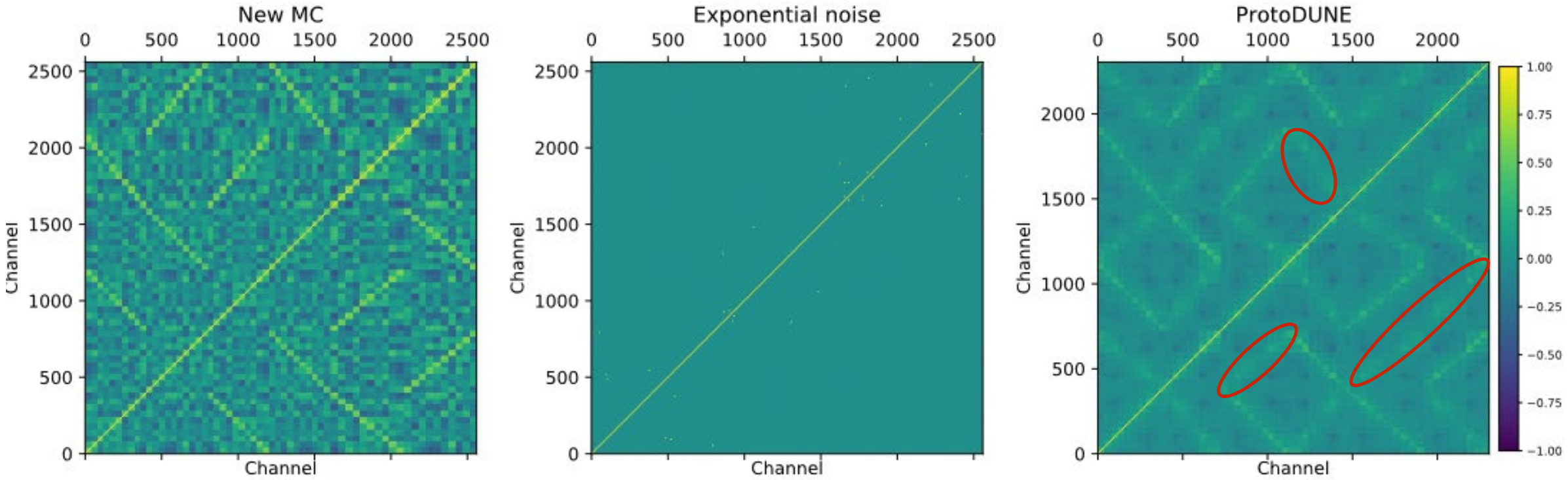
ProtoDUNE-II goals

DAQ (miniDAQ) performance (HD/VD)

- Verify hit finding / clustering / trigger (metric/method?)
  - ^{39}Ar?
  - Michel electrons?
- ROI (metric/method?)
- Get appropriate data files – which is??
- Currently MC→miniDAQ, develop MC DAQ model and ***test***?

ProtoDUNE-II goals

- Verify / improve noise model HD
- Develop one for VD



(figure from Pierre L./Babak A.)

ProtoDUNE-II goals

CCM/DQM

develop DAQ-based ‘physics’ monitoring

Example:
TP rate
TC rate(s)?

ProtoDUNE-II goals

What would go into DAQ section of a ProtoDUNE-II paper?