



Jefferson Lab



# *Status on of the Rare Eta Decays Studies: Trigger/DAQ Rates*

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# Trigger Rate

- Two types of processes were considered
  - Hadronic interactions (Pythia) superimposed with electromagnetic background in a 100 ns time window
  - Pileup of EM interactions in 100 ns window
- Geant simulation, PWO (120x120 cm<sup>2</sup>) cluster reconstruction
- Trigger algorithm:
  - Total energy deposition
  - $E_{\text{tot}} > 5 \text{ GeV}$  (~100 % trigger efficiency for signal decays produced at beam energies  $> 8 \text{ GeV}$ )
- Trigger/Data Rates:
  - Hadronic (with EM pileup): ~ 1 kHz
  - EM pileup: ~ 3 kHz

# Data Rate

- Average hit multiplicity  $\sim O(45)$
- Calorimeter event size and data rate:
  - $4 + 4 = 8$  bytes per event representing energy and time (headers not included)
  - 0.2 kByte per event
  - 800 kByte/sec
- Small trigger rate – possible to run in the Pulse Raw FADC readout mode, i.e., acquire fadc samples around threshold crossing. This mode will allow to analyze pulses offline. Example:
  - 80 ns time window (20 samples)
  - 40 bytes per hit, 2 kByte calorimeter event size, 8 Mbyte/sec data rate

## Next Steps

- Large MC sample for hadronic background  
( see presentation during “GlueX Upgrade“ meeting )