INTT Weekly Meeting

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General Updates

- The unpacker/decoder is done
  - Code is in a usable state and merged into coresoftware last week
  - Gave $dN/d\eta$ analysis group information on how to use it
  - Chris mentioned the event building issues had been mostly resolved
  - However, there are still some small discrepancies
- Some progress on my channel classification scheme, but...

Channel Classifier

- Procedure:
  - Idea is to model distribution as a sum of several (Gaussian) "modes"
    - A mode models a way a channel can function, e.g., "dead," "half," "good," "hot"
  - Fit the model to histogram of hit distribution over channels
  - Classify each channel using fitted model and Bayes' theorem
- Current issue getting the "modes" to converge to parameters reasonable to what they represent
  - For example, a Gaussian initialed with a mean of 0 ("dead") can end up converging to having the largest mean in the model
  - In general it's not practical to treat this for an arbitrary data set
- Alternate approach requires abstraction of how each Gaussian addend is initialized and interpreted
  - Worked on this approach during the meeting and it is working
  - Iterative initialization approached, guesses initial mean and standard deviation based on previous terms

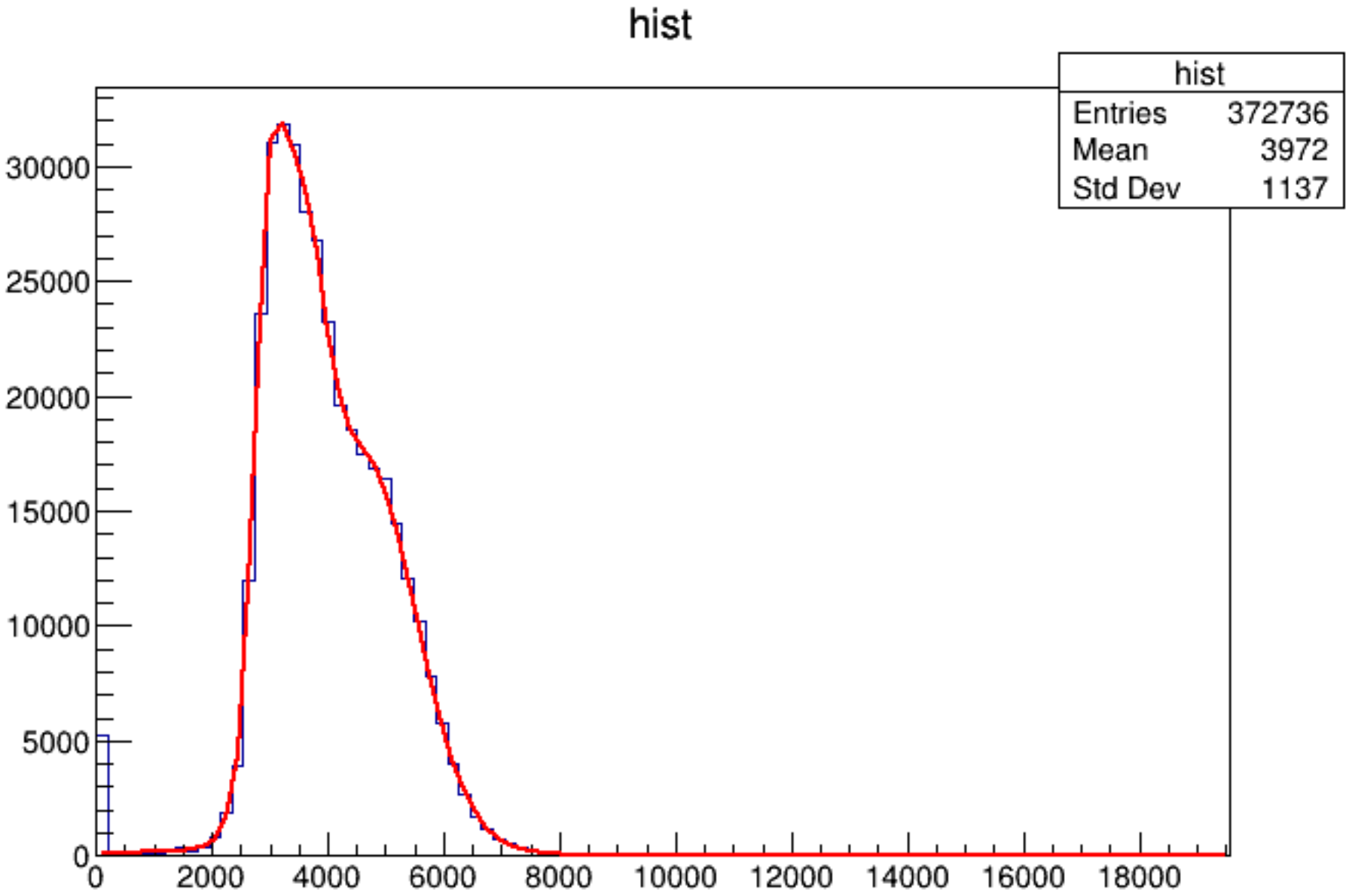

Figure: Channel hit multiplicity distribution as sum of Gaussians

Codes

- Unpacker/decoder codes (in coresoftware library):
  - https://github.com/sPHENIX-Collaboration/coresoftware/blob/master/offline/packages/intt/InttCombinedRawDataDecoder.h
  - https://github.com/sPHENIX-Collaboration/coresoftware/blob/master/offline/packages/intt/InttCombinedRawDataDecoder.cc
- Example macro which produces DSTs using the current unpacker:
  - https://github.com/josephbertaux/INTT/blob/josephb/general_codes/josephb/macros/CombinedRawDataDecoder.C
  - https://github.com/josephbertaux/INTT/blob/josephb/general_codes/josephb/macros/CombinedRawDataDecoder.sh
- Channel classifier codes
  - https://github.com/josephbertaux/INTT/tree/main/general_codes/josephb/codes/channel_classifier