Weekly Meeting

November 23, 2017

DQM

- Working on noisePSD decider, working it into dqm code that exists in DAQ
- Ben has already set up an environment to interact with the SQL database, so I've been working the code into that

DQM

- The general flow of the code:
  - connect to database in regards to specific decider (in this case noisePSD)
  - See if the settings for the decider needs updating or needs to be created. Create or update as needed
  - Check which series within the database do not have a decision made for your decider
  - For those series which a decision has not been made, make a decision based on setting parameters
  - Update decision to database
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Settings

- The settings have the following structure:
- Decider
  - Parameter
    - Entry type (all, calibration, etc…)
      - Entries (min values, max values, or json) can be applied to any or all channel, detector, or tower elements
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Settings

- For noisePSD, I have made the settings as such:
- Decider → noisePSD
  - Parameter → threshold number (1, 2, 3…)
    - Entries → use json structures and nested lists:
      - {'max' : [[min freq, max freq, value],[min freq, max freq, value]…], 'min' : [[min freq, max freq, value],[min freq, max freq, value]…]}
      - Can add as many as needed.
      - Overlap is okay. The decision will take the lowest point along the max threshold, or the highest point along the min threshold
      - Piece wise – allows for a lot of flexibility
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Adding in settings

- I've been thinking a lot about the best way to input these settings, especially because for this decider, it is not as simple as putting a min and max value in

Adding in settings

```
Number of thresholds=2
Threshold=t1
Applies to=all charge
Max entries=100 700000 2e-6 , 100 100000 8e-7
Min entries=100 700000 1e-9
Applies to=all phonon
Max entries=100 700000 5e-10 , 1000 700000 1e-10 , 200000 700000 8e-9
Min entries=100 700000 1e-12
Applies to=T1Z5
Max entries=100 700000 3e-10 , 1000 700000 6e-10 , 200000 700000 4e-9, 2000 2100 1e-9
Min entries=100 700000 1e-12, 2000 5000 3e-12
Threshold=t2
Applies to=all charge
Max entries=100 700000 4e-6 , 100 100000 1e-6
Min entries=100 700000 8e-10
Applies to=all phonon
Max entries=100 700000 7e-10 , 1000 700000 2e-10 , 200000 700000 1e-8
Min entries=100 700000 8e-13
end
```

Adding in settings

- The 'Applies to' part was the hardest to code in. The code now is able to handle overlap between channels
- E.g. one entry has 'all phonon', another entry has specific values for T1Z3 P_TOP_2 channel.
    - The code will favour the more specific entry.
    - So if all but one channel is the same, one does not need to specifically write in all the other channels for each detector
    - The same logic for specificity applies to detector, towers, all channels

Adding in settings

- The specificity ranks as such:
  - Specific channel
  - Charge channels in specific detector
  - Phonon channels in specific detector
  - Specific detector
  - Charge channels in specific tower
  - Phonon channels in specific tower
  - Specific tower
  - All charge channels
  - All phonon channels
  - All channels
- Overlapping channel entries within the same entry and from difference entries is taken care

Working Toward

- Plot noise PSD with threshold when a threshold is crossed
- When a decision is bad
    - Right now, it adds 'bad channel' whenever noisePSD crosses threshold at any point
    - Overall decision is good...how to we determine this? Is the overall decision good only if no threshold at any level for any channel is crossed? Should difference threshold levels be put into difference deciders entirely?
    - What to do when threshold is crossed? This needs further discussion
    - Right now, it is still tied very much to Soudan root