

Vertical drift validation system

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FD Sim/Reco Meeting

What is the VD Validation System?



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- We periodically receive questions of the form “what happens if we change x?”
- We can answer these questions, but it requires a lot coordination and person-hours to re-run the full analysis chain
- It would be better if we could make the requested change and then simply press a button and have the comparison between the baseline and the change appear
- This is the goal of the VD validation system

Pandora Validation System for DUNEFD HD



- Pandora already has infrastructure performing a similar task in place to test changes to the Pandora reconstruction in the DUNEFD HD accelerator context
 - Originally developed by Ryan Cross and Vito Di Benedetto
- Intermediate ArtRoot files comprise outputs from the full, pre-Pandora generation, simulation, signal processing chain for $O(10K)$ events
- We also have reference analysis outputs from running Pandora over those reference files
- If we make a change to Pandora, we can use the intermediate ArtRoot files as inputs to Pandora to ensure any changes are isolated to those Pandora updates and not any upstream changes

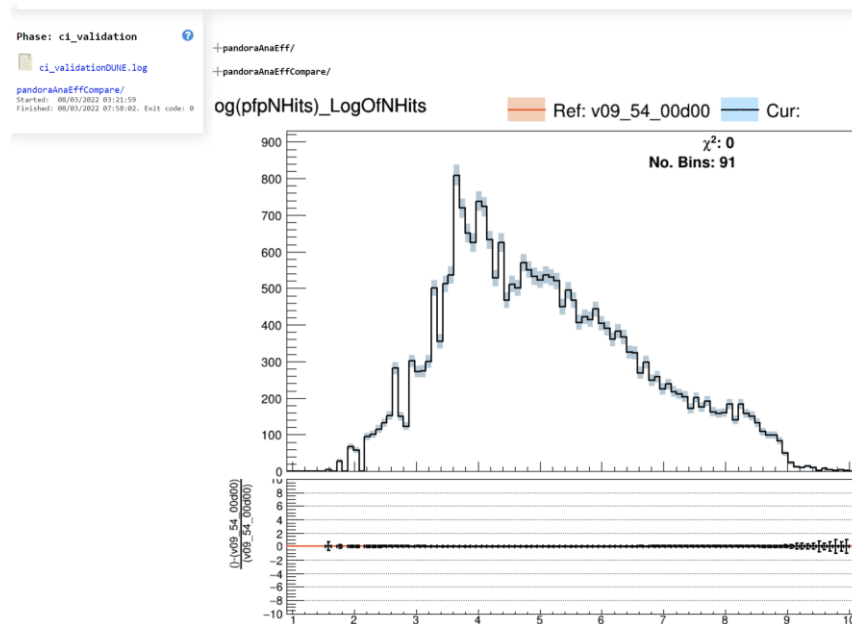
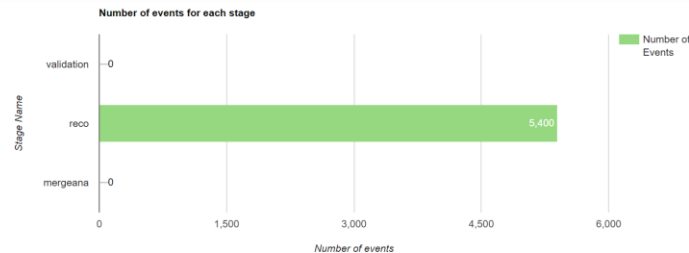
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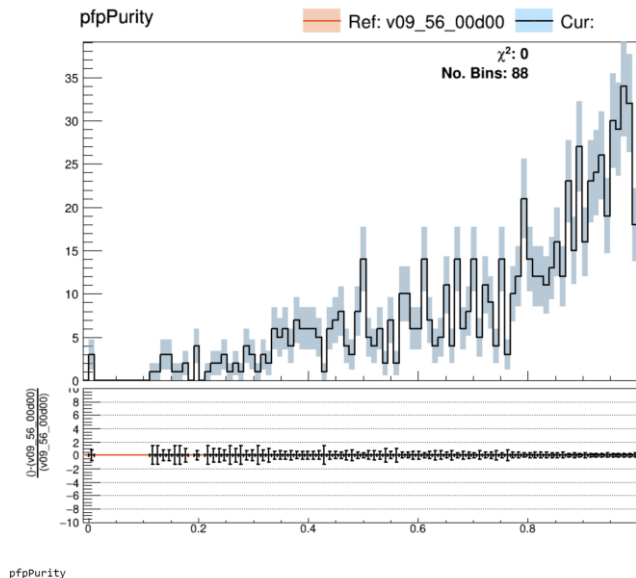
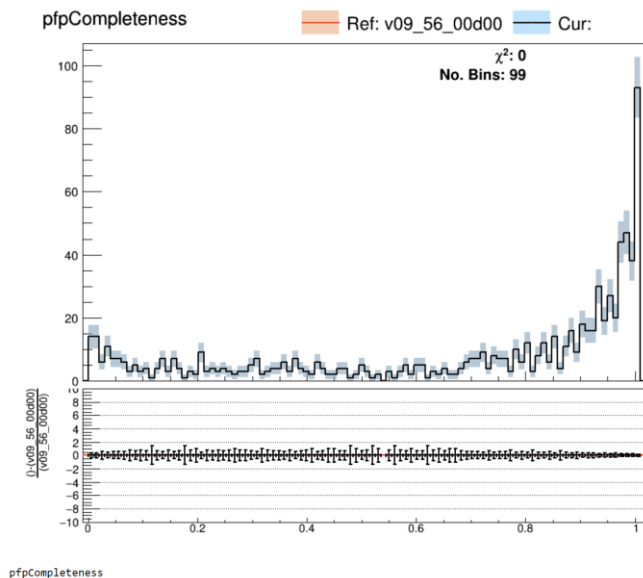
- We have a set of metrics that we can assess the effect of any changes on core reconstruction metrics
- We'd like to do something similar for vertical drift, but broadening the scope beyond Pandora changes



Current Status of the VD Validation System



- I've been updating the infrastructure to support DUNEFD VD
- Step 1 was to reproduce the existing Pandora validation system in the VD context
 - That is now done (very low stats for now, just testing the mechanics)



Next Steps



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- The next step is to allow this to run from different stages of the analysis chain
 - Vito has updated the CI architecture to support this
- One notable consideration will be retraining of the CVN given upstream changes
 - I think here we should probably look to fine tune the existing CVN weights, rather than starting from scratch
- In the short-term I'll use the existing analysis package that Ryan produced as the end product, but additional analysis/plotting packages can be added to address questions of interest