SVAC Ntuple And ACD Information

Anders W. Borgland

Science Verification, Analysis and Calibrations
Outline

• ACD Tile Map
• New ACD variables in the SVAC ntuple
• 8 tower + ACD Monte Carlo and new SVAC ntuples
• Summary
NEW! ACD Tile Map
ACD Tile Map

Instrument Analysis Meeting, August 5, 2005

Anders W. Borgland
ACD Tile Map And FRED

Tile in FRED

Tile ID from Map
SVAC Ntuple And ACD Information

- Currently the SVAC ntuple only contains GEM ACD information:
  - Region Of Interest (ROI):
    - GemRoiVector[iTower]
  - CNO:
    - GemCnoVector[12]
  - Tile list:
    - GemAcdTilesXzp
    - GemAcdTilesYzp ......
    - Bit encoded variables, see also p8
    - See GEM document, p124.
- Merit has high level ACD information:
  - AcdDoca
  - AcdTotalEnergy
  - AcdTileCount ......
- Proposal:
  - Add ACD digi information to the SVAC ntuple.
SVAC Ntuple: ACD Arrays

- Propose to add ACD digi information to the SVAC ntuple:
  - Use tile/ribbon ID as index in arrays:
    - Makes it convenient for the user
    - Easy to relate Map location with Array index
    - Makes arrays very sparse:
      » Factor 6 larger than necessary
      » Hopefully Root will compress away all the zeroes ....
  - Also need array for each PMT

- Propose:
  - AcdXXX [Tile ID] [PMT]
  - AcdXXX [0-603] [0-1]
SVAC Ntuple: New ACD Arrays

- Number of ACD digis:  
  - AcdNumDigis
- Pulse Height Analysis:  
  - AcdPha [Tile ID][PMT]
- Veto discriminator map:  
  - AcdHitMap [Tile ID][PMT]
- Range:  
  - AcdRange [Tile ID][PMT]
- Parity error:  
  - AcdParityError [Tile ID][PMT]
- Low discriminator set:  
  - AcdLowDisc [Tile ID][PMT]
- High discriminator set:  
  - AcdHighDisc [Tile ID][PMT]

This is a learning period!  
We should add anything we think may be useful!
ACD Digis and ACD GEM Information

- ACD Information in the GEM:
  - Fixed (short) pulse width
  - See Alex Moiseev's ACD talk in Workshop 4

- ACD tile list in the GEM:
  - Sampled at window closing
  - How to relate them to the ACD digi hit map?

- How to relate ACD tile list in the GEM with AcdHitMap[][] in the SVAC ntuple?
  - Use GEM document, p124, to decode GEM ACD tile bits and get tile IDs:
    - See next page
  - Then easy to look up AcdHitMap[tile][pmt]
  - NB! They will not be identical!
    - AcdHitMap[tile][pmt] made from full (non truncated) pulses.
GemAcdTilesXzm:
Bit encoded variable in SVAC ntuple

Figure 128  Contribution to event of XZM group in Veto List
Monte Carlo with 8 Towers And ACD

- Generated 8 tower + ACD surface muon MC:
  - See main IA page: MC Simulated Data
- ROI used is the default flight i.e. Full 16 tower ROI!
  - What (if any) changes do we need to make for 8 towers?
- Events are written out if the trigger word is non-zero:
  - This includes ROI set and no other triggers:
    - Most events are like that
- Made new SVAC ntuples with ACD arrays:
  - Files in the same directory:
    - Named 'svacACD'
- Size of SVAC root file:
  - Increased by 43%
Summary

• The ACD is coming and we better be ready!
• Proposal to add ACD information to the SVAC ntuple:
  – Did we include your favourite ACD variable?
  – If not, let us know asap!
• Surface muon MC with 8 towers and ACD available:
  – Now also with new SVAC ntuples
• Feedback is really appreciated!