

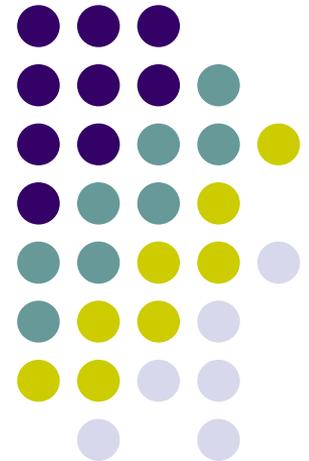
Update: Onboard Filter & Ground Software Integration

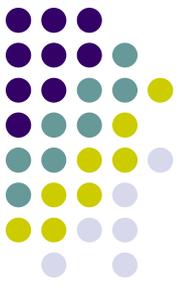
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Analysis Group Meeting; 28 July 2003





Tasks

- Integrate onboard filter with GlastRelease
- Verify filter logic and function
- Extract info from filter
 - Examine filter track finding
 - Verify that ACD and CAL info agree w/ Gleam
- Use filter to calculate impacts on science performance (mainly effective area & FOV).
Guide for iteration on algorithms.



Integration Status

- Initial versions of EbfWriter and OnboardFilter are available on CVS (v0r0, v0r0)
 - These are working, but not approved versions
 - Coming soon: a code review, and official changes from JJ Russell
- In the TDS: the filter status code, and some basic info from the filter
 - ACD, TKR, CAL info in bit form – will be deciphered and useful ntuple variables formed
- Filter appears to work as expected
 - Output is consistent with event display and MeritTuple
- EbfWriter crashes occasionally
 - Debugging right now
- Filter documentation exists and will be made available

Contents of Status Bits



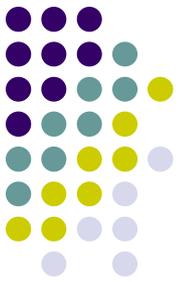
•	DFC_V_STATUS_ACD	= 0,	/*!< ACD was analyzed	*/
•	DFC_V_STATUS_DIR	= 1,	/*!< DIR was decoded	*/
•	DFC_V_STATUS_ATF	= 2,	/*!< ACD/TKR veto was analyzed	*/
•	DFC_V_STATUS_CAL1	= 3,	/*!< CAL was analyzed, phase 1	*/
•	DFC_V_STATUS_TKR	= 4,	/*!< TKR finding was done	*/
•	DFC_V_STATUS_ACD_TOP	= 5,	/*!< ACD top tile struck	*/
•	DFC_V_STATUS_ACD_SIDE	= 6,	/*!< ACD side tile struck	*/
•	DFC_V_STATUS_ACD_SIDE_FILTER	= 7,	/*!< ACD filter tile struck	*/
•	DFC_V_STATUS_TKR_POSSIBLE	= 8,	/*!< Possible track	*/
•	DFC_V_STATUS_TKR_TRIGGER	= 9,	/*!< Have a 3-in-a-row trigger	*/
•	DFC_V_STATUS_CAL_LO	= 10,	/*!< Cal Lo Trigger	*/
•	DFC_V_STATUS_CAL_HI	= 11,	/*!< Cal Hi Trigger	*/
•	DFC_V_STATUS_TKR_EQ_1	= 12,	/*!< Exactly 1 track	*/
•	DFC_V_STATUS_TKR_GE_2	= 13,	/*!< Greater or equal 2 tracks	*/
•	DFC_V_STATUS_TKR_THROTTLE	= 14,	/*!< Throttle bit set	*/
•	DFC_V_STATUS_TKR_LT_2_ELO	= 15,	/*!< Low energy, no 2 track evidence	*/
•	DFC_V_STATUS_TKR_SKIRT	= 16,	/*!< Event into the skirt region	*/
•	DFC_V_STATUS_TKR_EQ_0	= 17,	/*!< No tracks	*/
•	DFC_V_STATUS_TKR_ROW2	= 18,	/*!< Track Row 2 match	*/
•	DFC_V_STATUS_TKR_ROW01	= 19,	/*!< Track Row 0 or 1 match	*/
•	DFC_V_STATUS_TKR_TOP	= 20,	/*!< Track Top match	*/
•	DFC_V_STATUS_ZBOTTOM	= 21,	/*!< No tracks into CAL with energy	*/
•	DFC_V_STATUS_ELO_ETOT_90	= 22,	/*!< E layer 0/ETOT > .90	*/
•	DFC_V_STATUS_ELO_ETOT_01	= 23,	/*!< E layer 0/ETOT < .01	*/
•	DFC_V_STATUS_SIDE	= 24,	/*!< Event has a side face veto	*/
•	DFC_V_STATUS_TOP	= 25,	/*!< Event has a top face veto	*/
•	DFC_V_STATUS_SPLASH_1	= 26,	/*!< Event has a splash veto	*/
•	DFC_V_STATUS_E350_FILTER_TILE	= 27,	/*!< Event <350Mev + filter tiles	*/
•	DFC_V_STATUS_E0_TILE	= 28,	/*!< Event 0 energy + tile hit	*/
•	DFC_V_STATUS_SPLASH_0	= 29,	/*!< Event has a splash veto	*/
•	DFC_V_STATUS_NOCALLO_FILTER_TILE	= 30,	/*!< No CAL LO trigger + filter tile	*/
•	DFC_V_STATUS_VETOED	= 31	/*!< Any veto	*/

Veto Bits



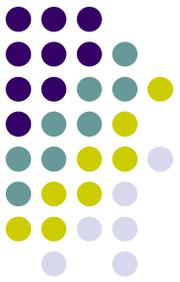
Preliminary Results

- Currently looking at frequency of veto reasons for different sources, energies, incident angles
 - Examining necessity and effects of logic changes
- Have done **preliminary** effective area calculations (all_gamma, TKR triggered):
 - <100 MeV, McZDir < -0.9: 0.062 m²
 - 100 MeV – 1 GeV, McZDir < -0.9: 0.87 m²
 - > 1 GeV, McZDir < -0.9: 1.13 m²



Current Work

- Debugging EbfWriter
- Looking at veto frequencies
- Evaluating possible changes in logic
- Continuing extraction of info from filter



Next Steps

- Arrange filter output into useful ntuple variables
- Make tracks & ACD hits visible in event display
- More definitive effective area – solid angle calculations
- Compare reconstructed tracks with incoming particles