ALERT meeting - Kalman Filter updates

Felix Touchte Codjo

IJCLab

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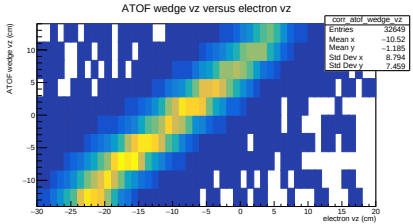
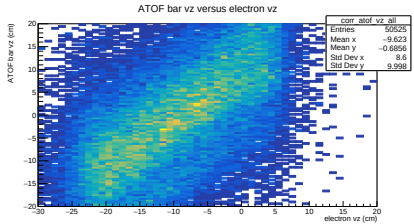
Updates (ongoing work)

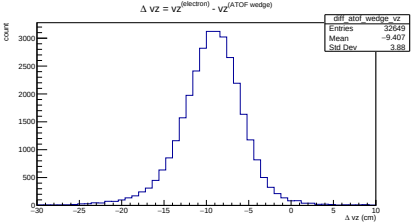
- **Adding the ATOF hit in the Kalman Filter**
  - Use **ALERT::ai:projections** {`trakid, matched_atof_hit_id`}
    → nb. of matches (elastic events): 30%
  - Cannot use **ATOF bars** due to the bad resolution in z
    → the bars were deduced using the same layer id as the wedge or ± 1
  - The current implementation use the **ATOF wedges**

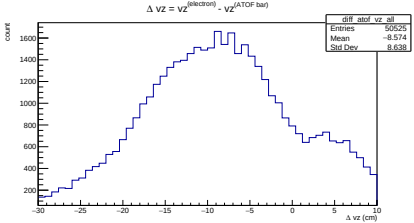
Updates (ongoing work)

- The Wedge resolution is better than the Bar resolution (elastic events)



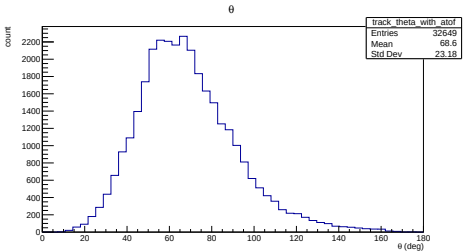




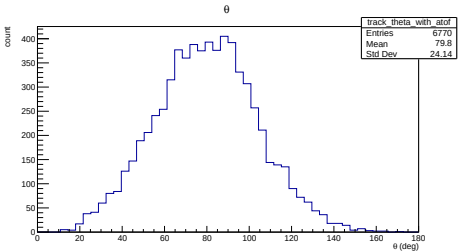


Updates (ongoing work)

- We have a misalignment between ATOF and AHDC
- We have an improvement in the theta reconstruction of elastics



(a) before : ATOF wedge not applied

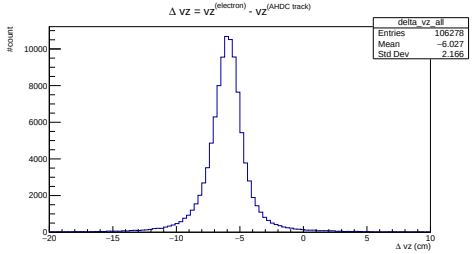


(b) after : ATOF wedge applied

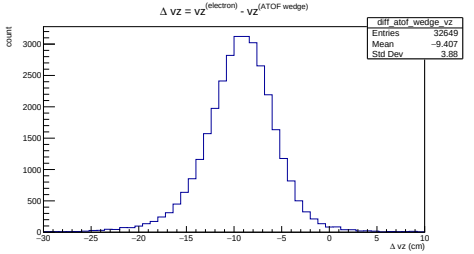
Updates (ongoing work)

- No significant changes have been observed on the residual, Δv_z and $\Delta\phi$
- Next steps:
  1. Use the Kalman Filter to predict ATOF hits (wedges)
     $\rightarrow$ After a first KF fit, project the track on the surface of the ATOF and check new hits
  2. Check that the PID is correctly used by the Kalman Filter

- Not presented during the meeting but useful to see the shift between AHDC and ATOF
- Confusion in the notation: $\Delta vz^{(\text{ATOF wedge})}$ is not exactly the vertex but the z position of the wedge. I should have made the projection before computing the difference. However, the projection should only explain 5 % of the shift.



(a) AHDC



(b) ATOF