Start Counter Efficiency

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Projected tracks selection and Efficiency Calculations

- Do not use SC time in track fitting.

- Get a quality charged track with the following cuts:
    - Number of Hits per track >=14
    - Track_FOM >= $2.69E^{-3}$
    - abs(vertex_z – target center) <=15 cm
    - Radial cut < 1 cm

- The track must be matched to BCAL OR (FCAL && TOF).

- Get the t_0 of each track projected to a SC sector (RF bunch time).

- Get the RF time at the target center and correct for the location of the vertex along the target (Vertex RF time).

SC Hits and Efficiency Calculations

- Loop over the SC hits determined by the hit factory.

- Get the hit time SC_time. Correct for the propagation time, flight time.
- Calculate the SC shifted time t.

- If -2 < t-t0 < 2 ns, check if the same projected sector had hit or its nearest paddle, (Count SC hits).
- Calculate the accidentals by counting the out of time hits for   -6 ns< t-t0 && t-t0 < 6ns
- Calculate the accidental subtracted efficiency = (SC hits - accidentals) / Projected hits.
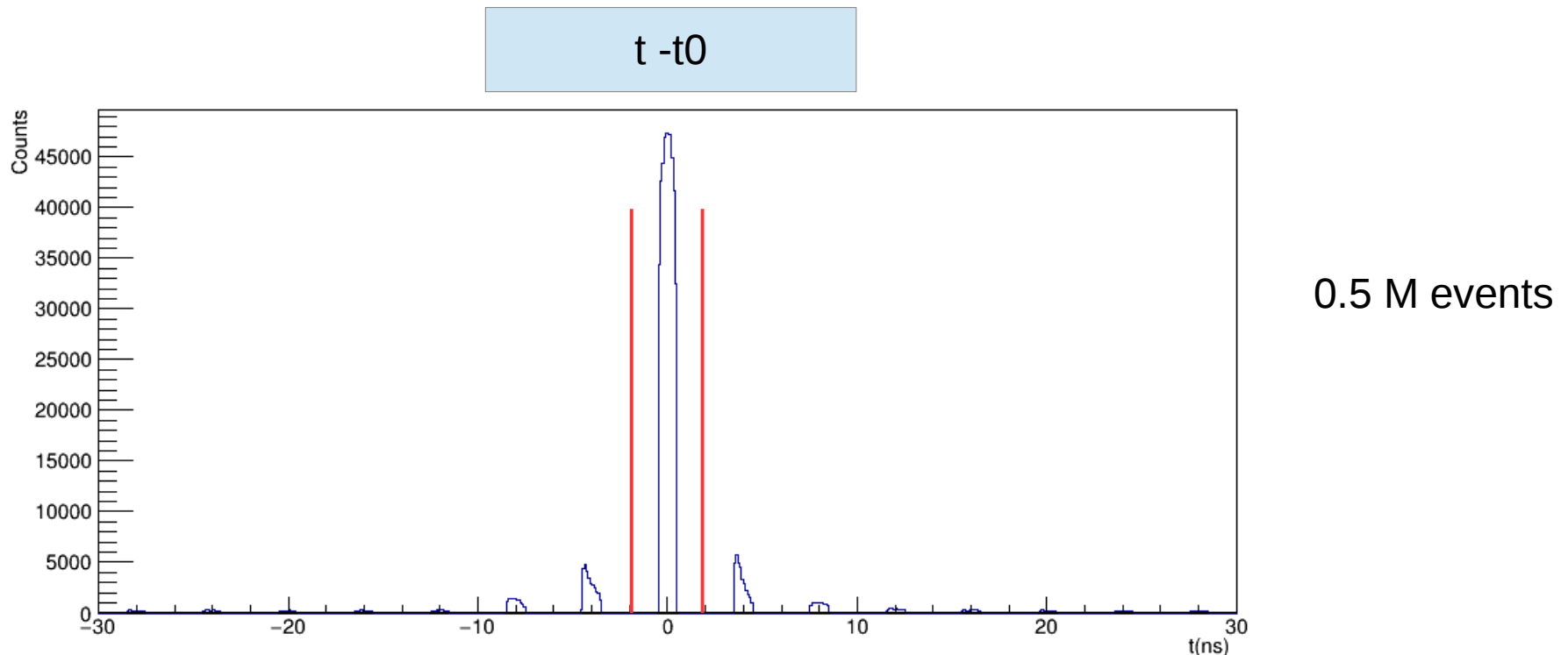
t -t0

0.5 M events

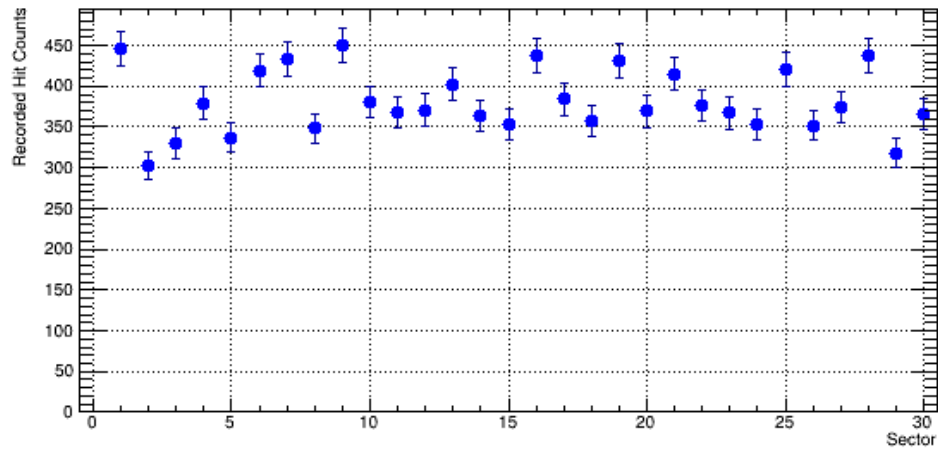# SC projected tracks, recorded hits, and accidentals for DATA

SC Efficiency for Data

Increase the timing cut

- f -6 < t-t0 < 6 ns, check if the same projected sector had hit or its nearest paddle, (Count SC hits).
- Calculate the accidentals by counting the out of time hits for   -12 ns< t-t0 && t-t0 < 12ns
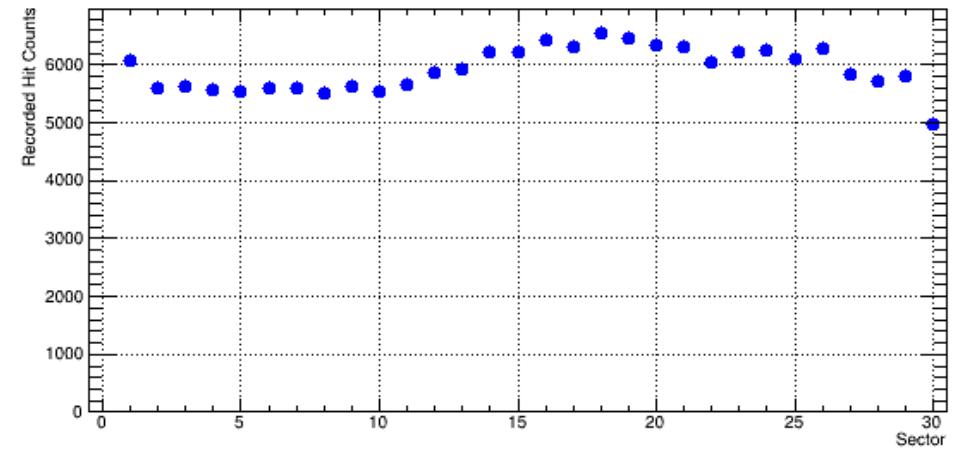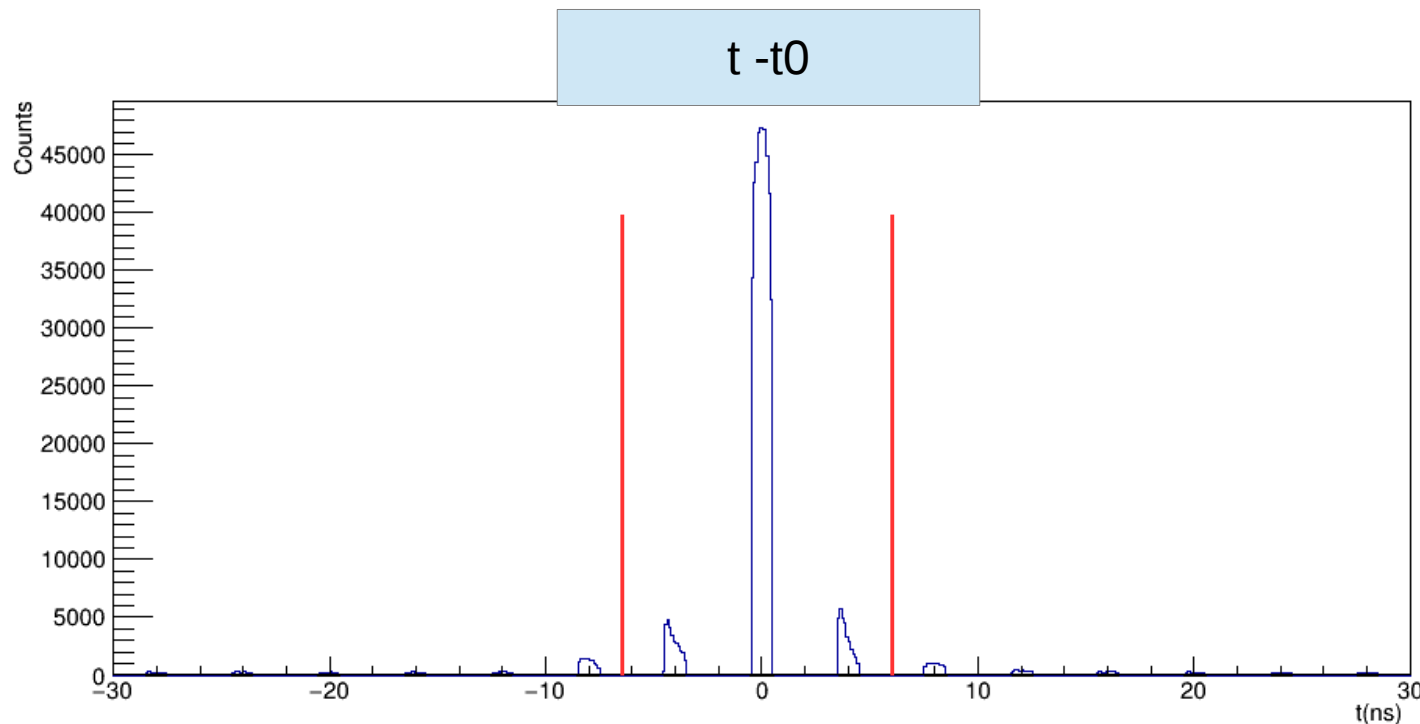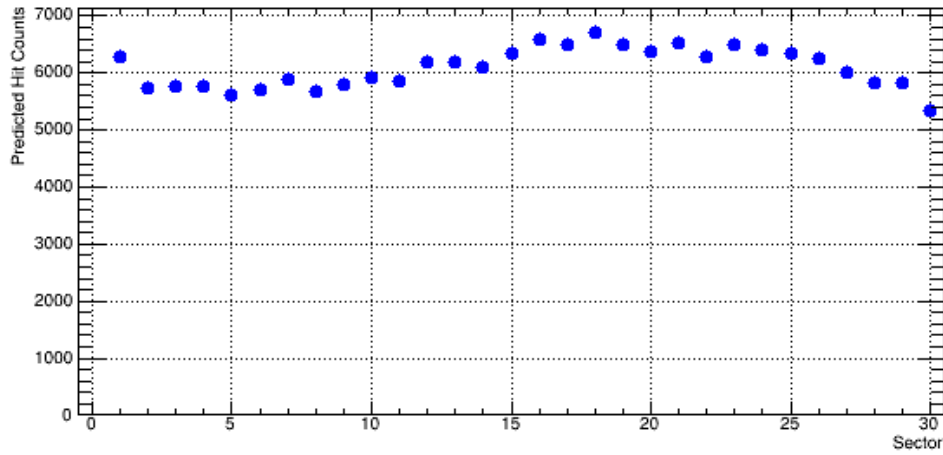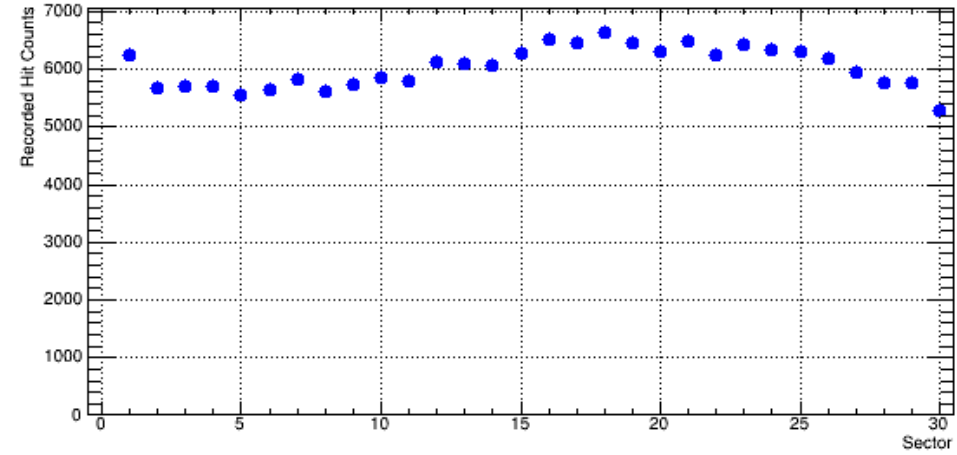

t -t0

0.5 M events
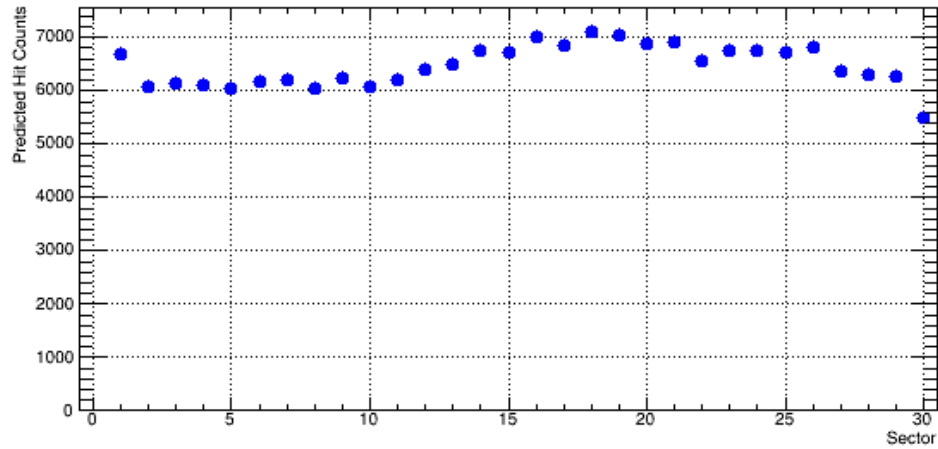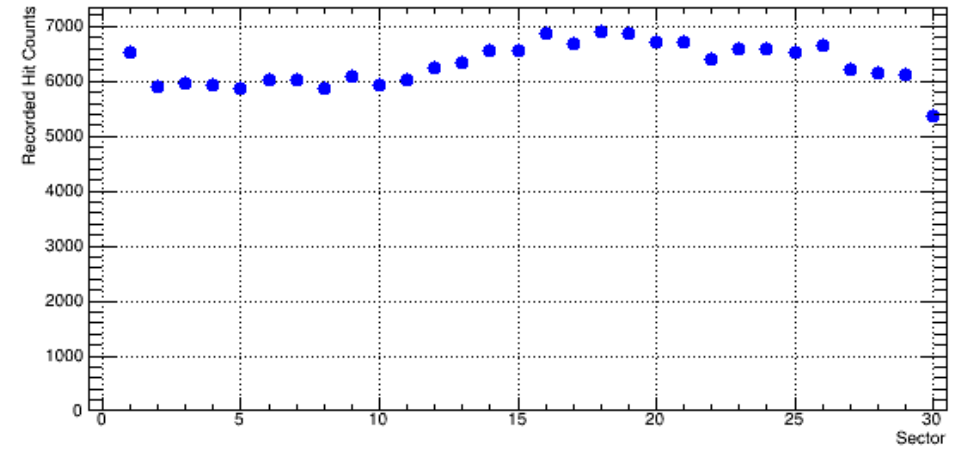
SC projected tracks, recorded hits, and accidentals for DATA
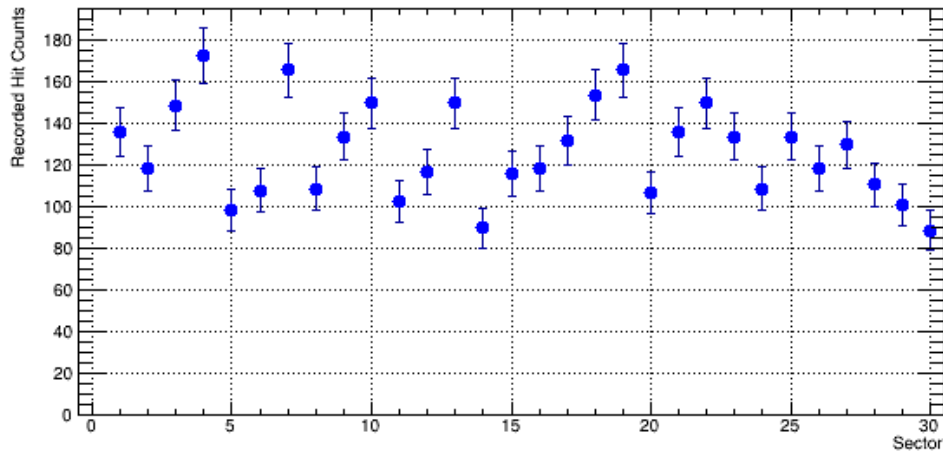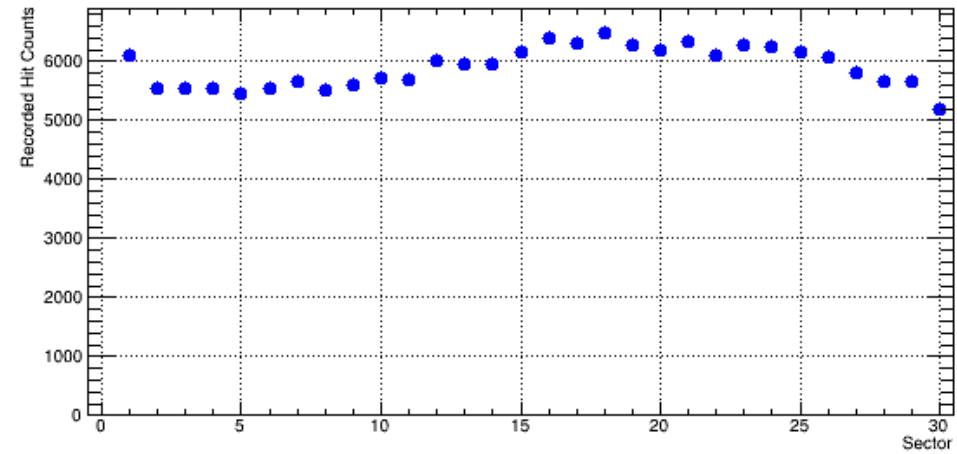
SC Efficiency for Data

Accidental subtracted efficiency

Overall Efficiency = 96.8 ± 0.2

Accidental subtracted efficiency

Nose Section Efficiency = 96.8 ± 0.3

Bend Section Efficiency = 97.2 ± 0.7

Straight Section Efficiency = 97.2 ± 0.4