New beam center calculation & STAR ToF detector

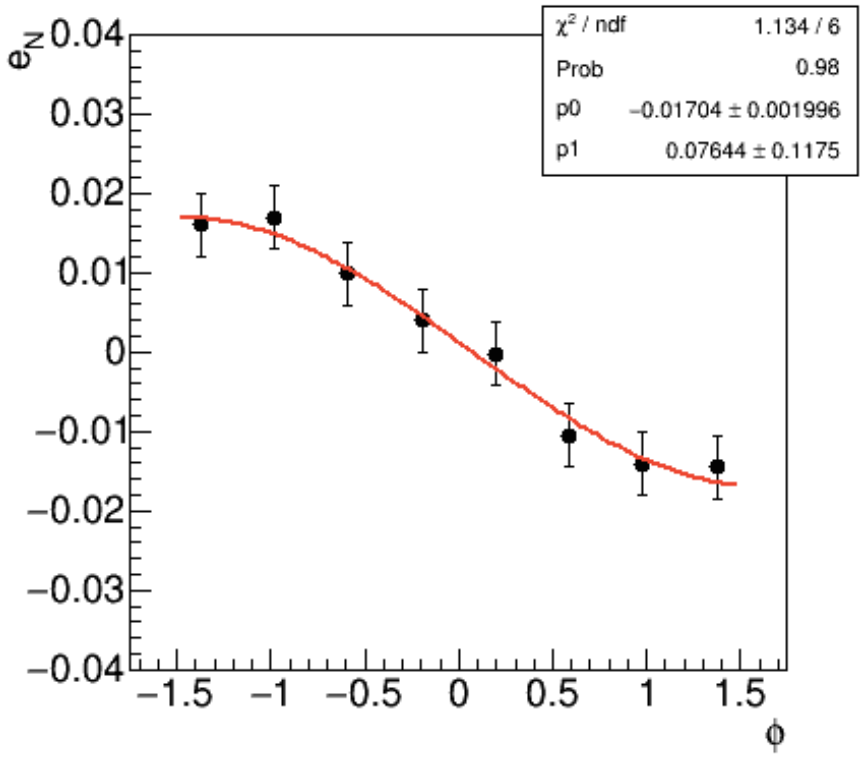
22 Feb. 2019
Minho Kim

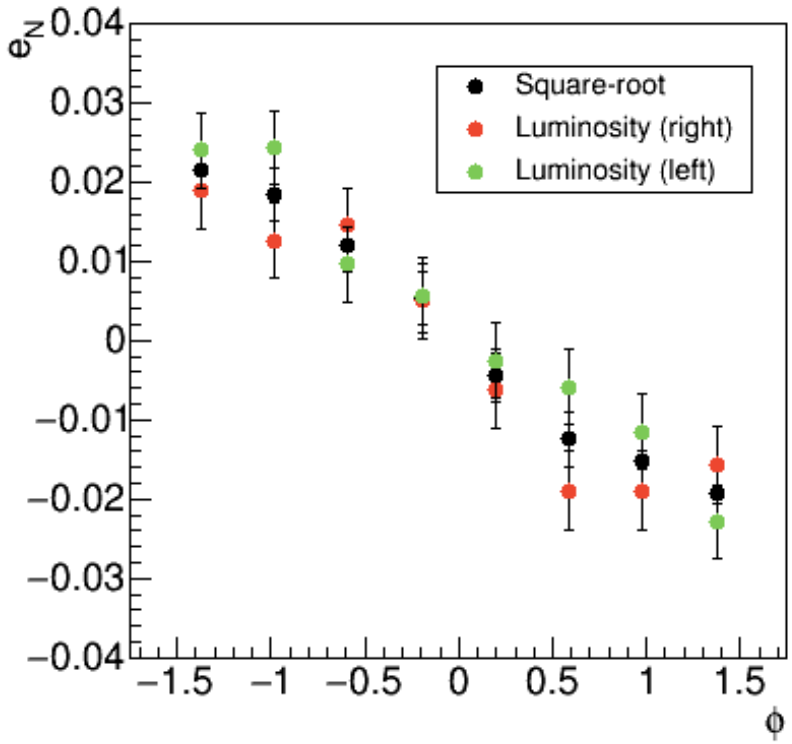
New beam center for middle position run

Fill No.	21148
By scan (mm)	(N/A, 2.6±0.8)
By hit (mm)	(0.0±0.4, 0.2±0.7)

- Discrepancy between y beam center calculated by fitting the neutron hit map and asymmetry scan. With new reconstruction, asymmetry scan gave beam center y = 1.2.
- No difference for the beam center by hit.

Neutron ε_N angular modulation

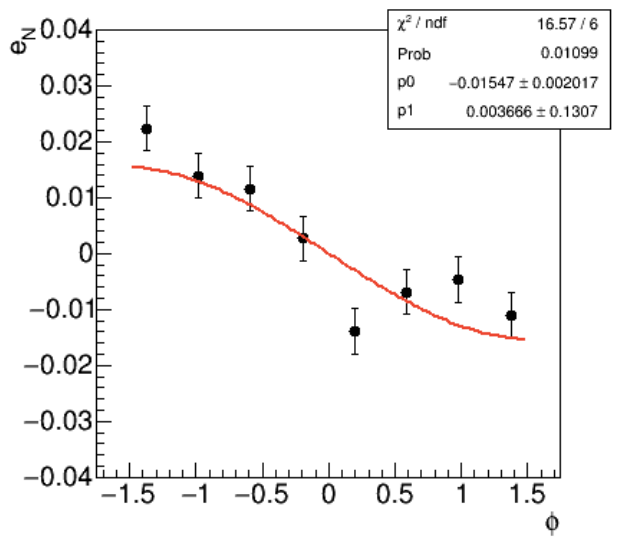




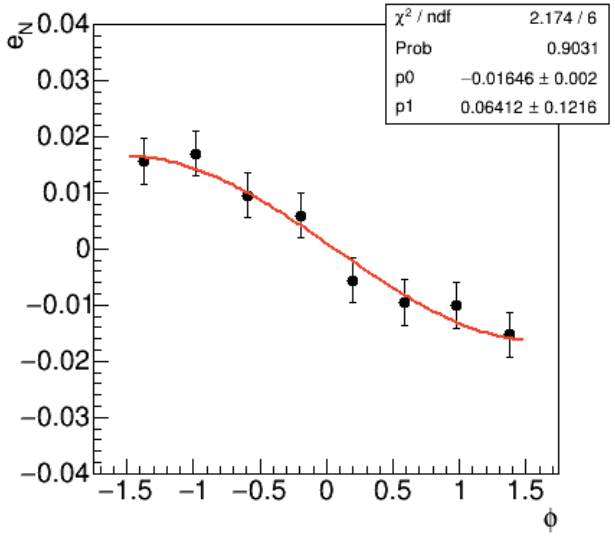
- All data points show good agreement with fitting function.
- Raw asymmetries by luminosity formula is also consistent with squre-root ones.

Neutron ε_N by different beam center X

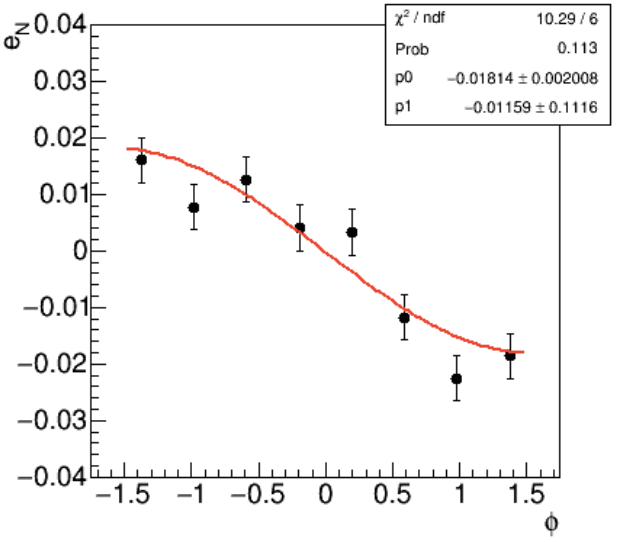
(X_{hit}-2, Y_{scan})



(X_{hit}-1, Y_{scan})

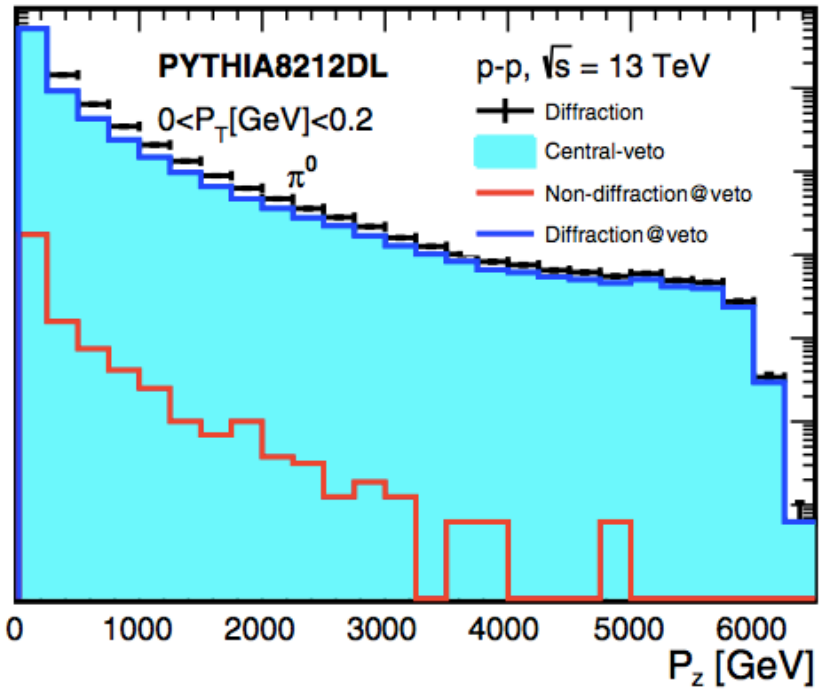


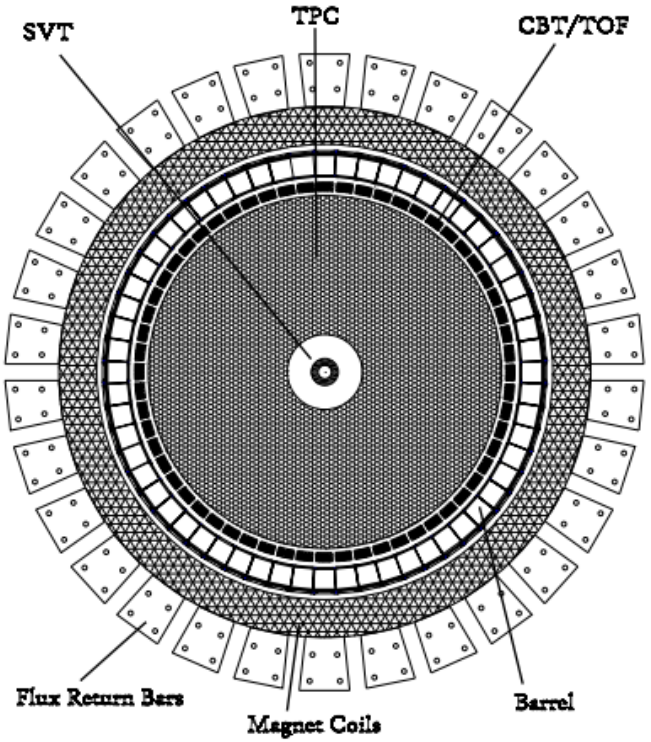
(X_{hit}+1, Y_{scan})



- With further X position from X_{hit} neutron raw asymmetry modulation is calculated, more data points get out of fitting function.
- It would be OK if we just use the X_{hit}.

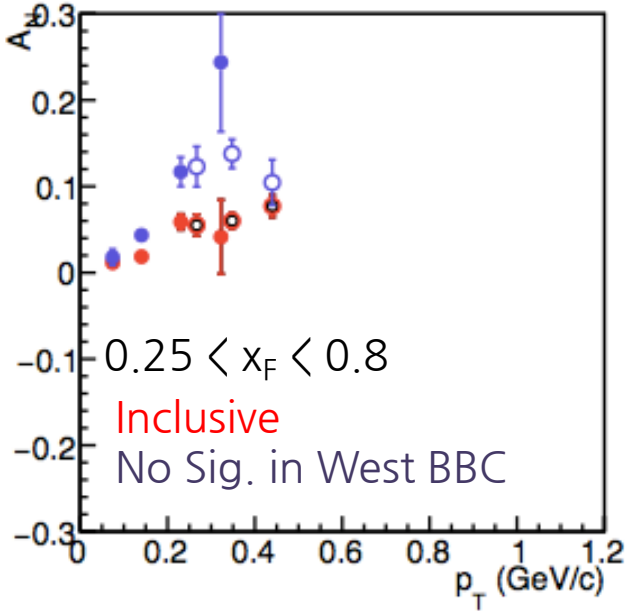
STAR ToF detector

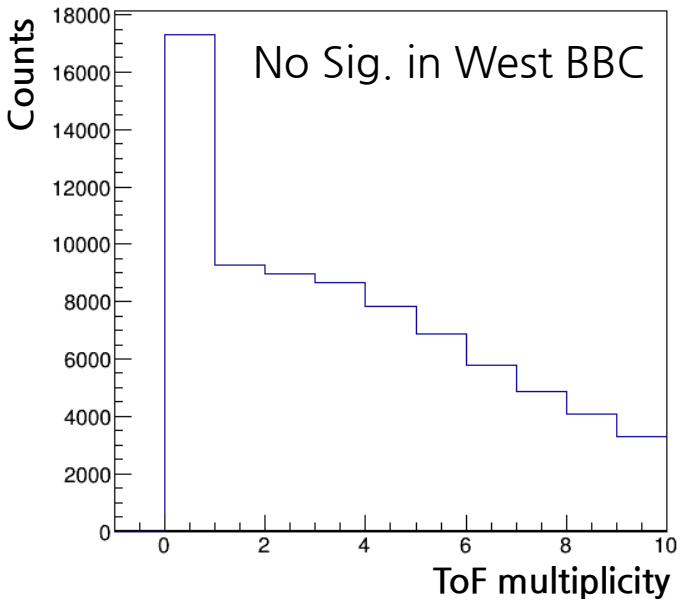


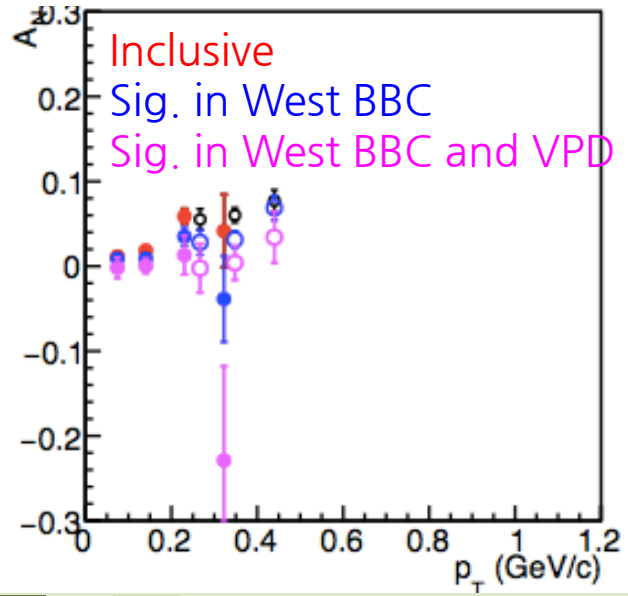


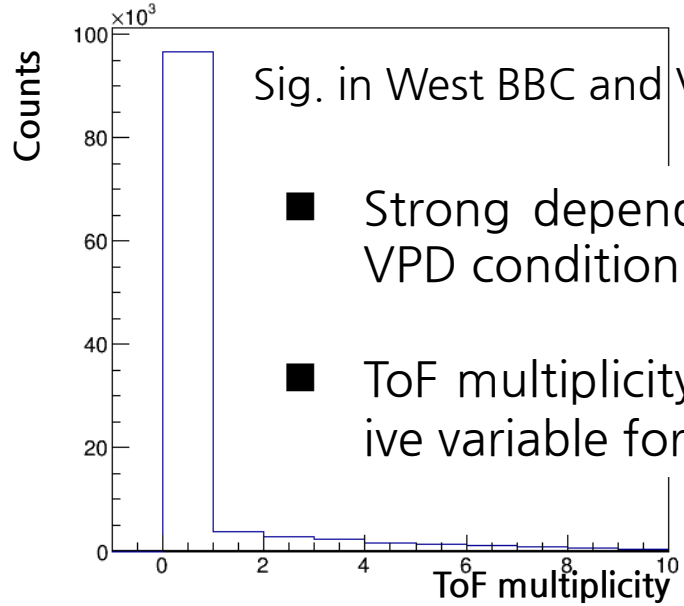
- Purity of central-veto (TPC N_{track} = 0) events is almost 100%.
- For the moment, ToF multiplicity can be an alternative variable for diffractive/nondiffractive-like event separation.

ToF multiplicity dependence









- Strong dependence on the BBC & VPD condition.
- ToF multiplicity can be an alternative variable for N_{track} of TPC.