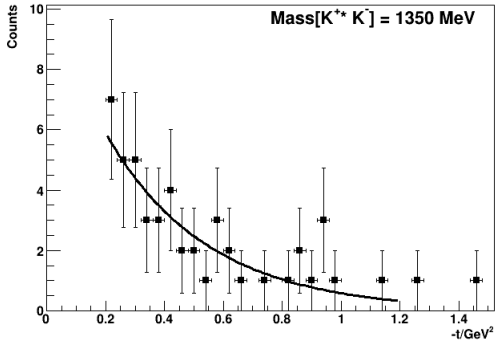
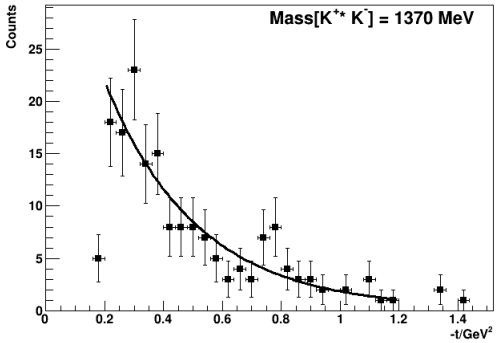
Mass dependent t-slopes at low invariant-mass K^*K and use of sigmoid function for estimating background under $\varphi \rightarrow K^+K^-$ events

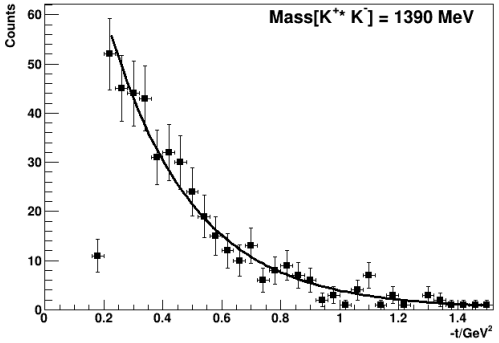
Mass dependent *t*-slopes at low invariant-mass K^*K

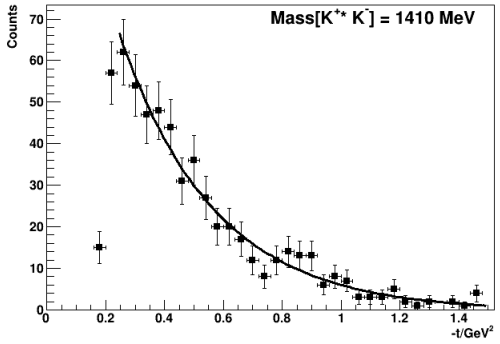
- Recently discovered that the *t*-slope had mass dependence
- Previous analysis used fixed *t*-slope = -1.15/GeV^2 for all mass[K^*K] values

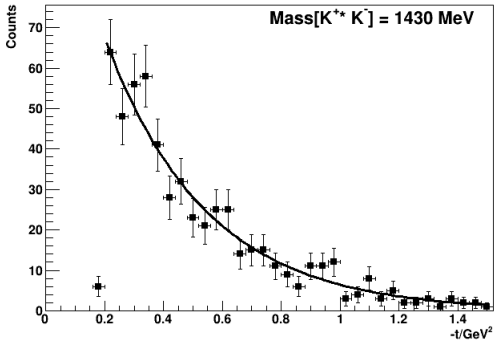
t-slope fits (slide 1)

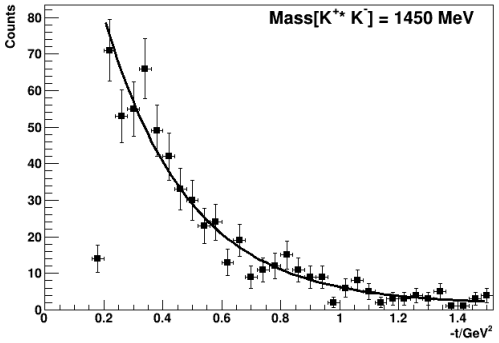


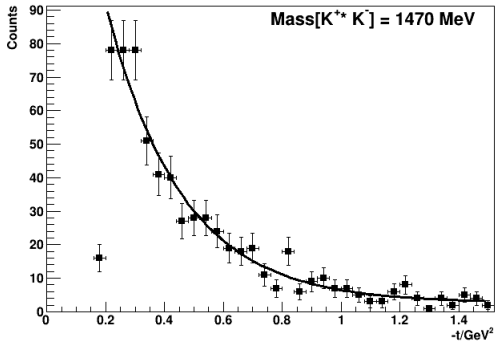


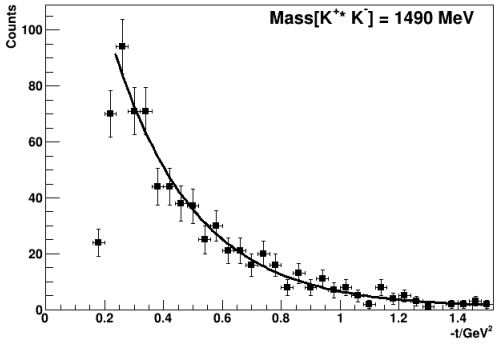


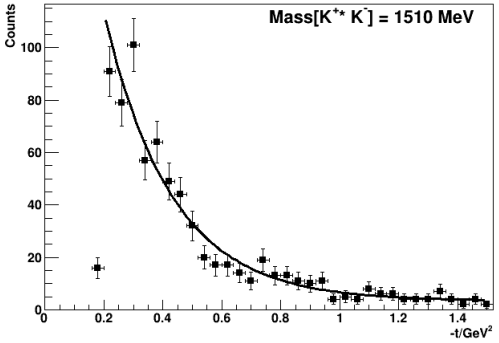




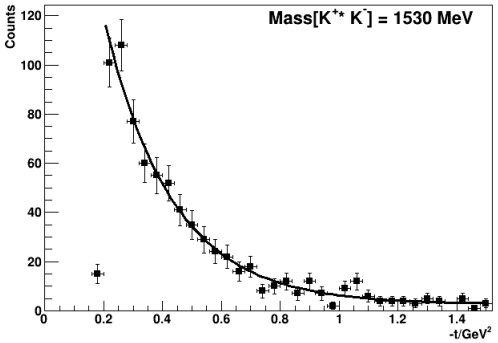


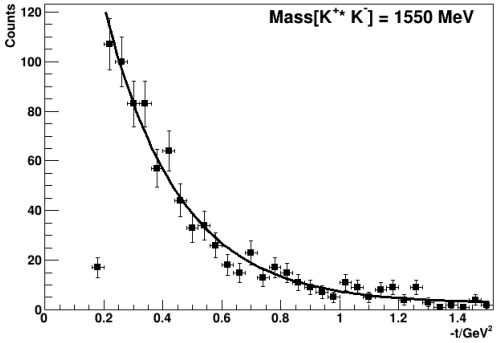


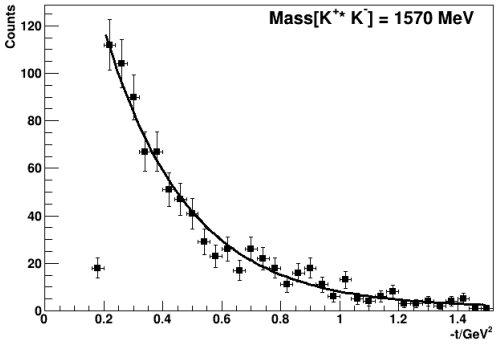


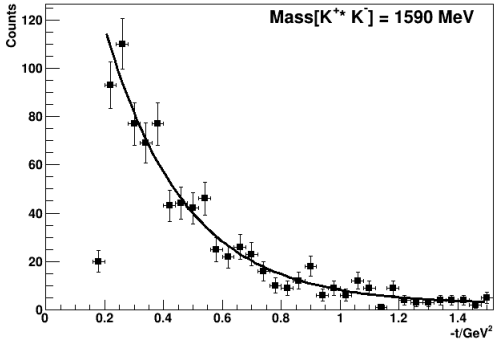


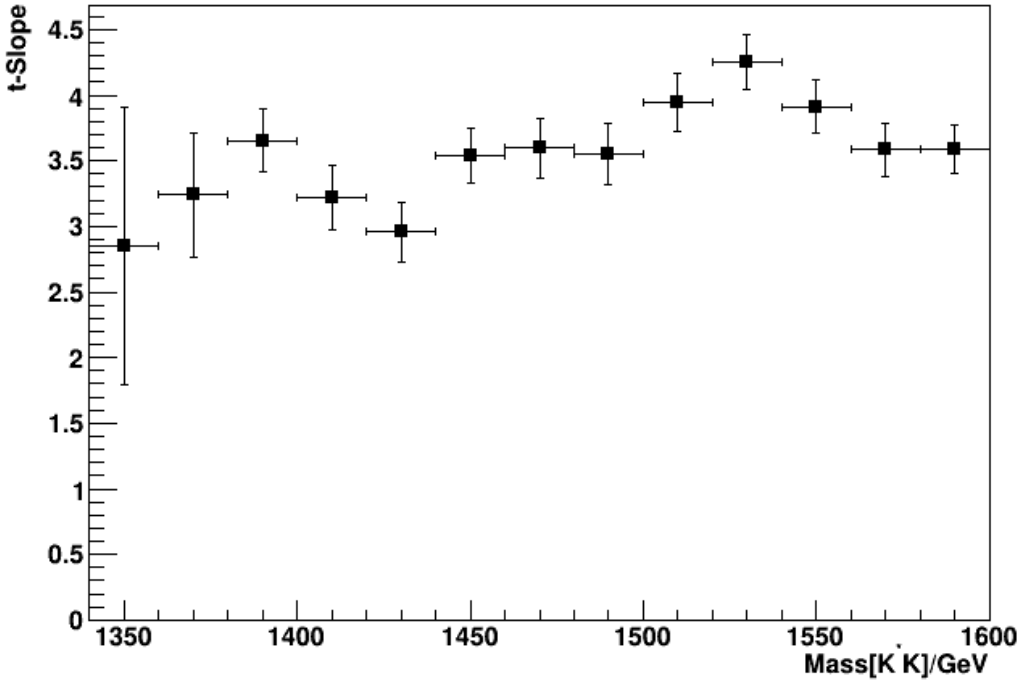
t-slope fits (slide 2)









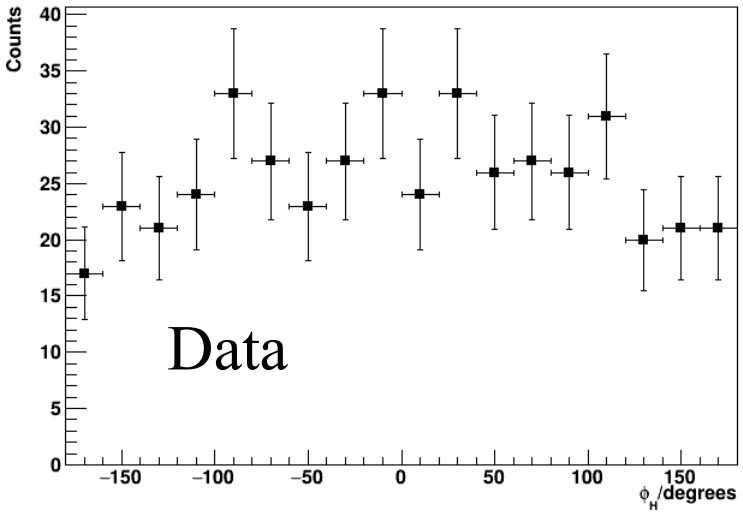


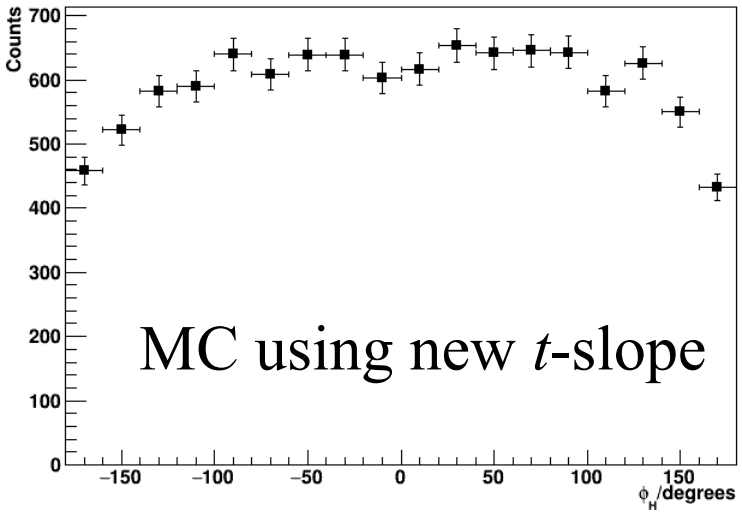
Definition of (θ,φ) and $(\theta_H,\varphi_{\mathrm{H}})$

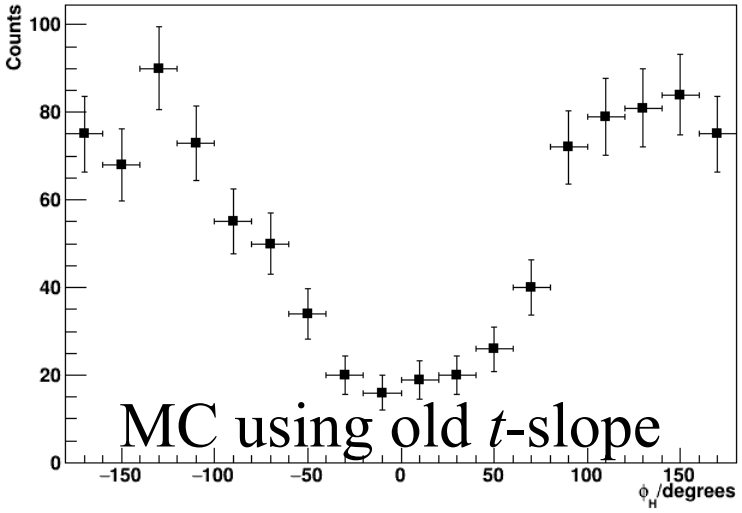
- The (θ,φ) angles defined from polar and azimuthal angles of the K^*, in helicity frame of K^*K system: z-axis coincident with the K^*K system and y-axis in direction of cross product of beam with z-axis

- The (θ_H,φ_H) angles defined from polar and azimuthal angles of the Kaon, in the helicity frame of the K^*: z_{H}-axis coincident with the K^* and the y-axis in direction of cross product of z-axis (from above) with the z_{H}-axis

t-slope influence on φ_H distribution for Mass[K^*K] = 1.390 GeV

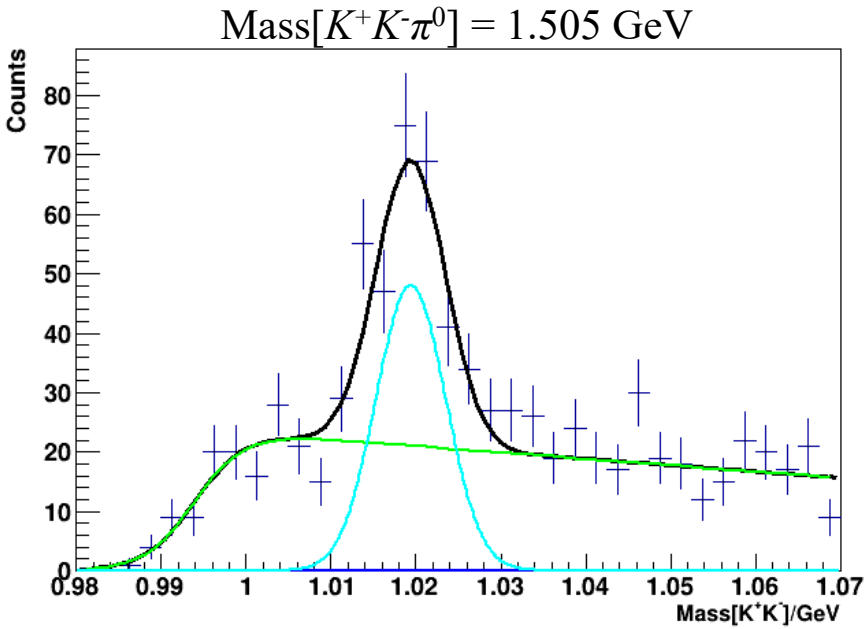






Background threshold behavior estimated through use of sigmoid function

- Fitting function includes
  - Gaussian function representing φ meson
  - Math Background (1st order polynomial) multiplied by sigmoid



- Alan will show more sophisticated treatment of that includes Voight function representations of the φ and additional $a_0(980)$

Title