

Recoil Proton Kinematics

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Recoil proton kinematics: During the May 14-15 2007 PID Workshop we discussed identification of the recoil proton especially with regard to identification in BCAL and dE/dx in the CDC. Here we consider the kinematics of the recoil proton in the reaction:

$$\gamma p \rightarrow X p$$

where E_γ is uniformly chosen in the range 8.5 to 9.0 GeV, and M_X is uniformly chosen in the range 1.0 to 2.5 GeV/c^2 . The momentum transfer squared, t , is assumed to follow a distribution of the form $e^{-\alpha|t|}$ where α is 2.0, 5.0 or 10.0 $(\text{GeV}/c)^{-2}$. Figure 1 shows the distribution in momentum, angle and transverse momentum for the recoil proton for the three values of α while Figure 2 shows the momentum as a function of angle for the three values of α .

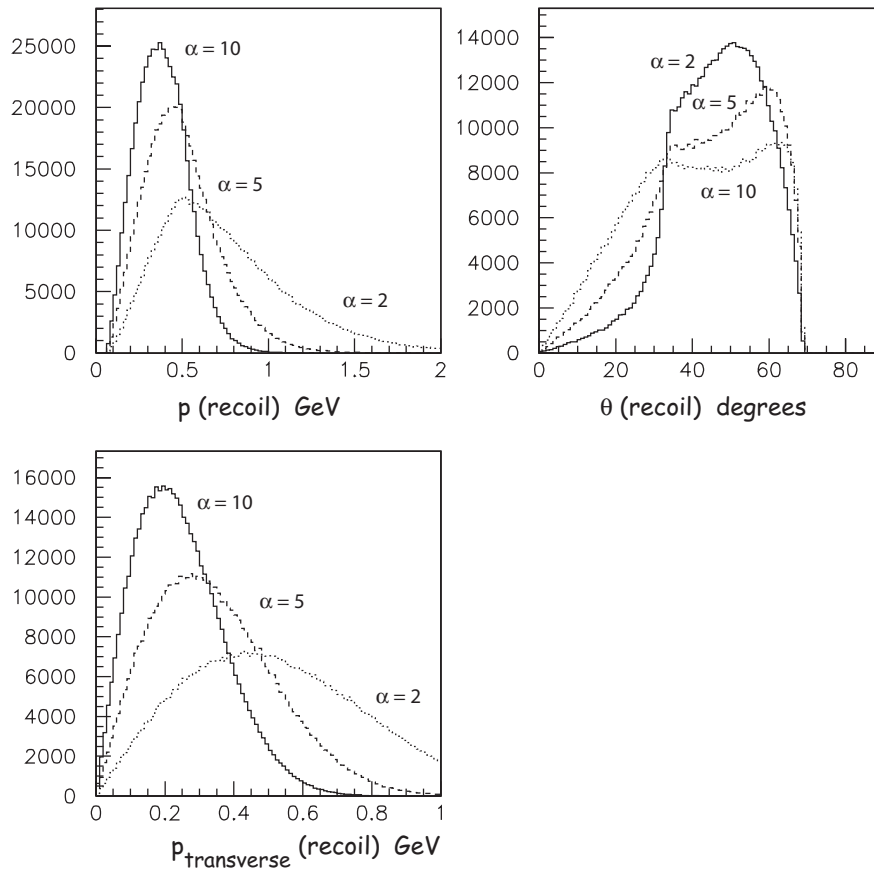


Figure 1: Distribution in momentum, angle and transverse momentum for the recoil proton for the three values of α .

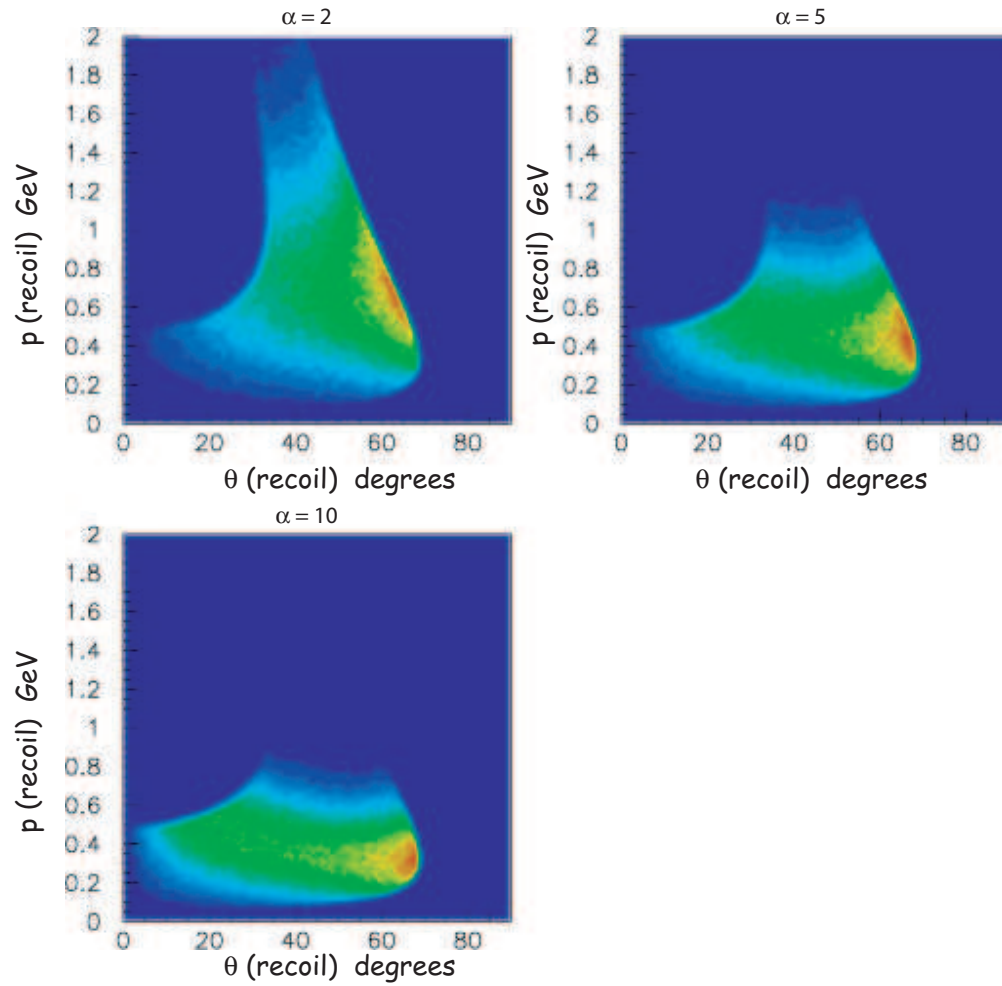


Figure 2: Momentum as a function of angle for the recoil proton for the three values of α .