$$m_p = 938.28 MeV/c^2 \tag{1}$$

$$KE_i^{WC4} = \sqrt{p_{WC4}^2 + m_p^2} - m_p \tag{2}$$

$$KE^{TPC} = KE_i^{WC4} - E_{Map} \tag{3}$$

$$E_{Flat} = 66.6 MeV \tag{4}$$

$$E_{Calo} = \sum_i \left(\frac{dE}{dx}\right)_i \times (TrackPitch)_i \tag{5}$$

$$E_{Length} = \left(\frac{dE}{dx}\right)_{mean} \times (TrackLength) \tag{6}$$

$$KE^{Calo} = \sum_i \left(\frac{dE}{dx}\right)_i \times (TrackPitch)_i \tag{7}$$

$$KE^{Flat} = KE_i^{WC4} - E_{Flat} \tag{8}$$

$$KE^{Length} = \left(\frac{dE}{dx}\right)_{mean} \times (TrackLength) \tag{9}$$

$$\Delta E = E_{Calo} - E_{Length} \tag{10}$$

$$\Delta KE = KE^{TPC} - KE^{Length} \tag{11}$$

$$\Delta KE = KE^{TPC} - KE^{Calo} \tag{12}$$

$$\Delta KE = KE^{TPC} - KE^{Flat} \tag{13}$$

$$\Delta KE = KE^{Flat} - KE^{Calo} \tag{14}$$

$$\Delta KE = KE^{Flat} - KE^{Length} \tag{15}$$

$$E_{Loss} = KE_i^{WC4} - E_{TPC} \tag{16}$$