Flow notebook

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I. $AA - pp$ METHOD

Flow vector is taken from the same eta/pt region. Assume for simplicity that there exist two equivalent flow vectors (as in random subevents). POI flow vector is denoted as u_i. Then one can write for correlation in AA-collisions

$$\langle u_i Q^* \rangle_{AA} = v_i v_Q M_{Q,AA} + \delta_{i,AA} M_{Q,AA} \tag{1}$$

where v_i is POI flow, v_Q is average flow of particles in Q-vector, $\delta_{i,AA}$ – average nonflow correlations of POI and Q-particles. Similarly

$$\langle Q_a Q_b^* \rangle_{AA} = v_Q^2 M_{Q,AA}^2 + \delta_{Q,AA} M_{Q,AA}^2 \tag{2}$$

In pp- collision one has

$$\langle u Q^* \rangle_{pp} = \delta_{i,pp} M_{Q,pp} \tag{3}$$

$\delta_{i,pp}$ – average nonflow correlations of POI and Q-particles in pp collisions. Similarly

$$\langle Q_a Q_b^* \rangle = \delta_{Q,pp} M_{Q,pp}^2 \tag{4}$$

The main assumption of "AA-pp" method is that

$$\delta_{pp} M_{Q,pp} = \delta_{AA} M_{Q,AA} \tag{5}$$

which is usually used only to correct Eq. 1, but in the case of "strong" nonflow correlations, Eq. 2 also might be corrected.

It would yield for final result

$$v_{i,AA-pp} = \frac{\langle u_i Q^* \rangle_{AA} - \langle u_i Q^* \rangle_{pp}}{\sqrt{\langle Q_a Q_b^* \rangle_{AA} - \langle Q_a Q_b^* \rangle_{pp} M_{Q,AA}/M_{Q,pp}}} \tag{6}$$