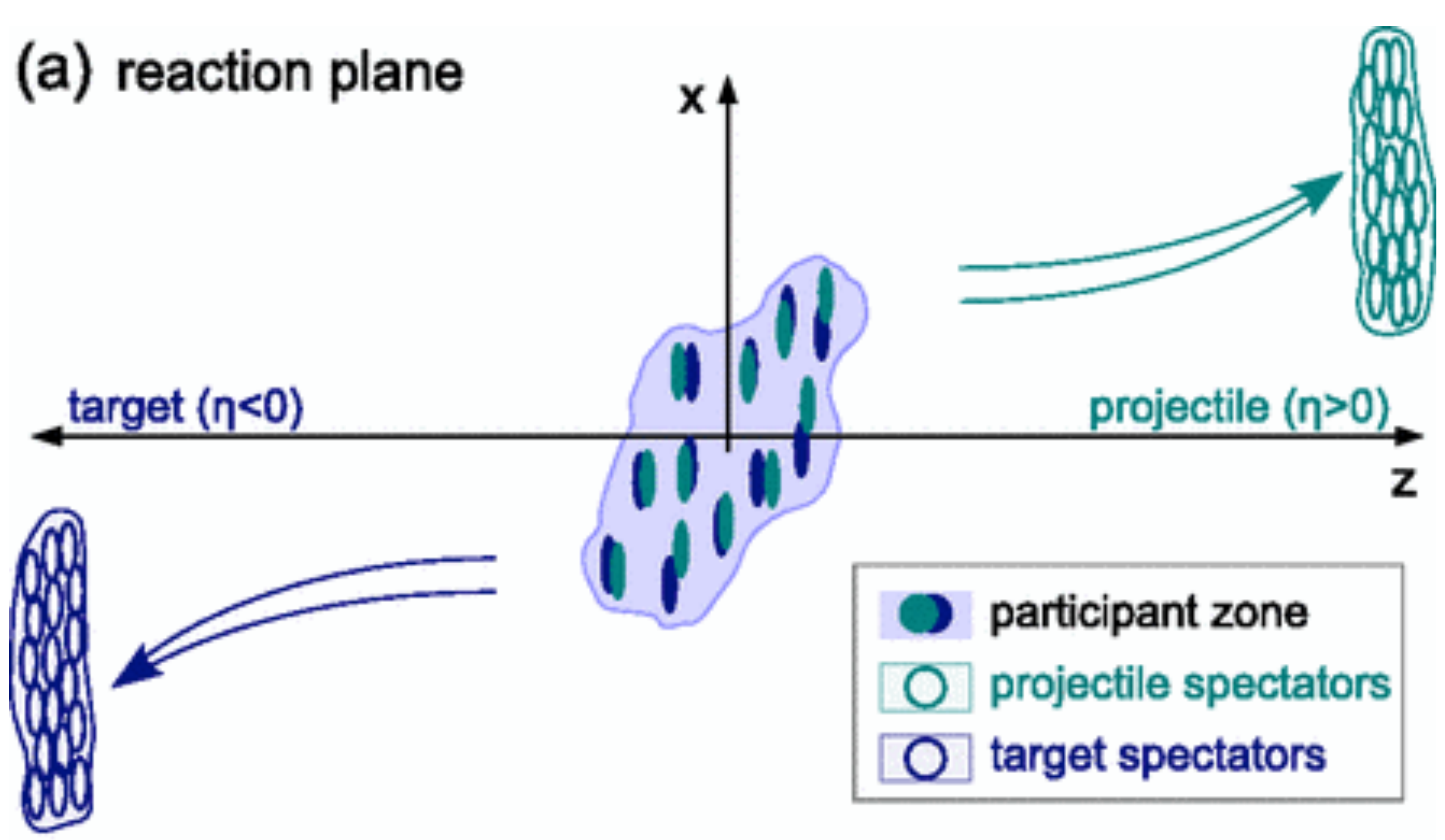
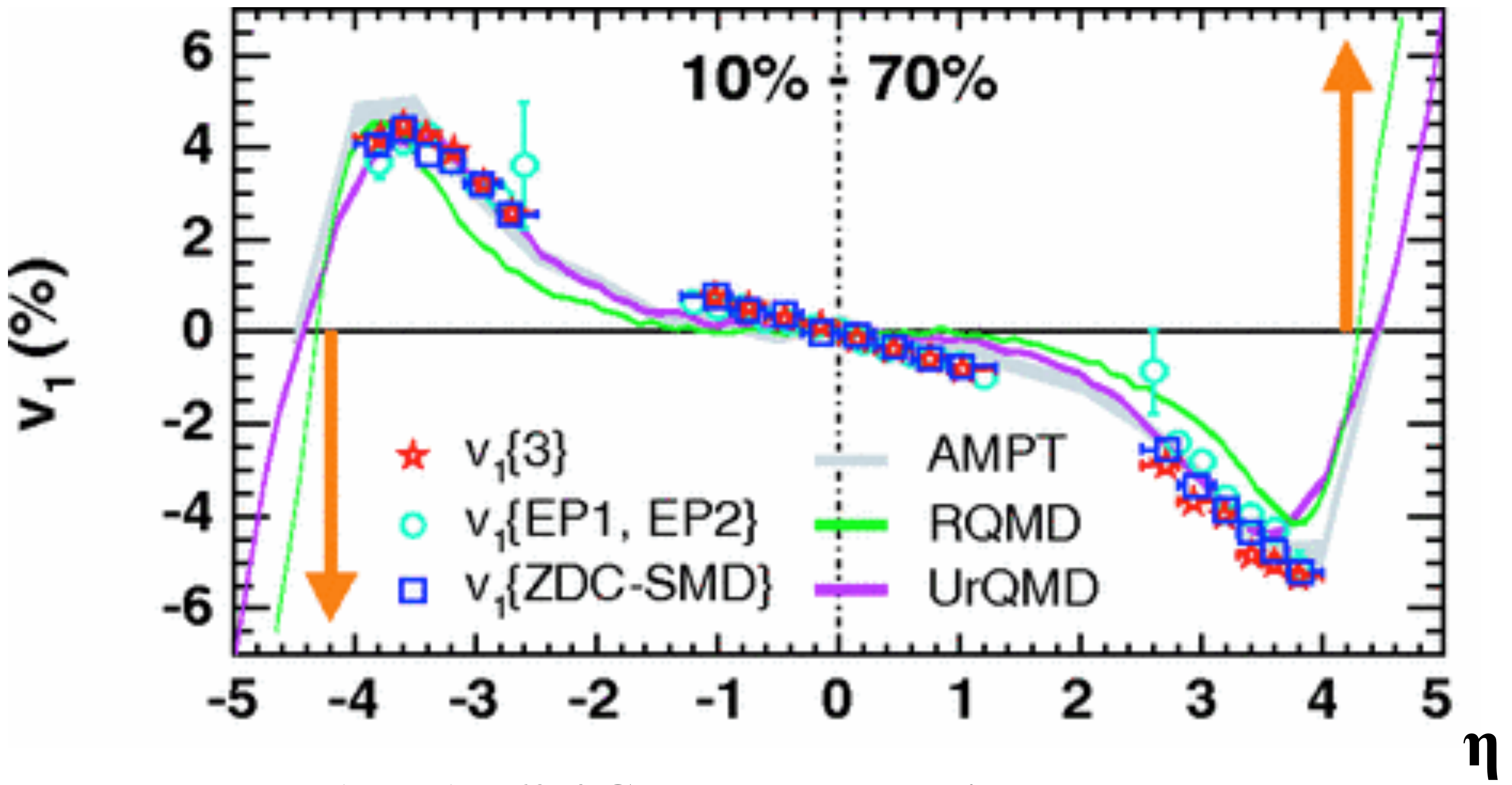
Femtoscopic studies w.r.t. Ψ_1

ALICE Collaboration, Phys. Rev. Lett. 111 (2013) 232302



STAR Collaboration, Phys. Rev. C 73 (2006) 34903

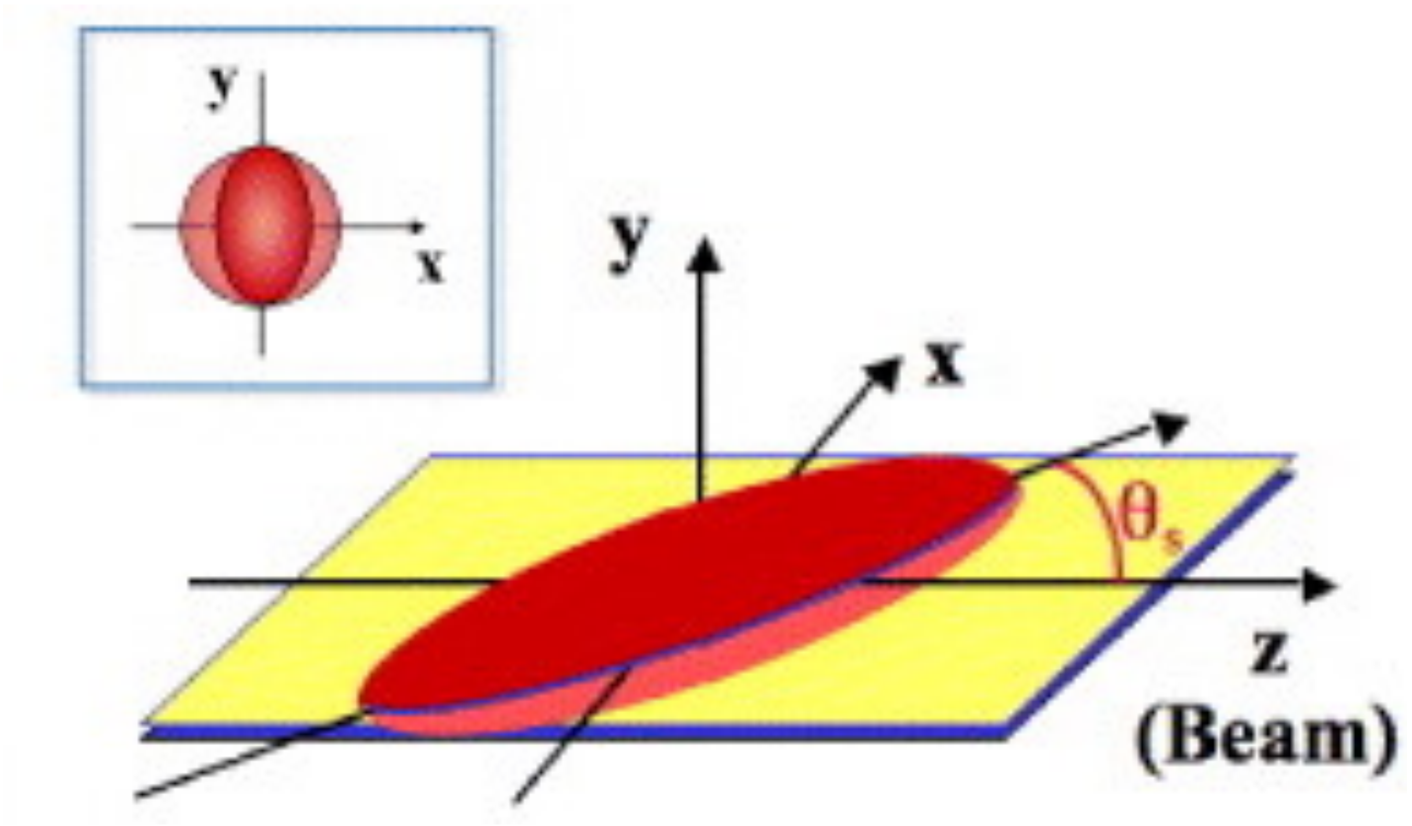


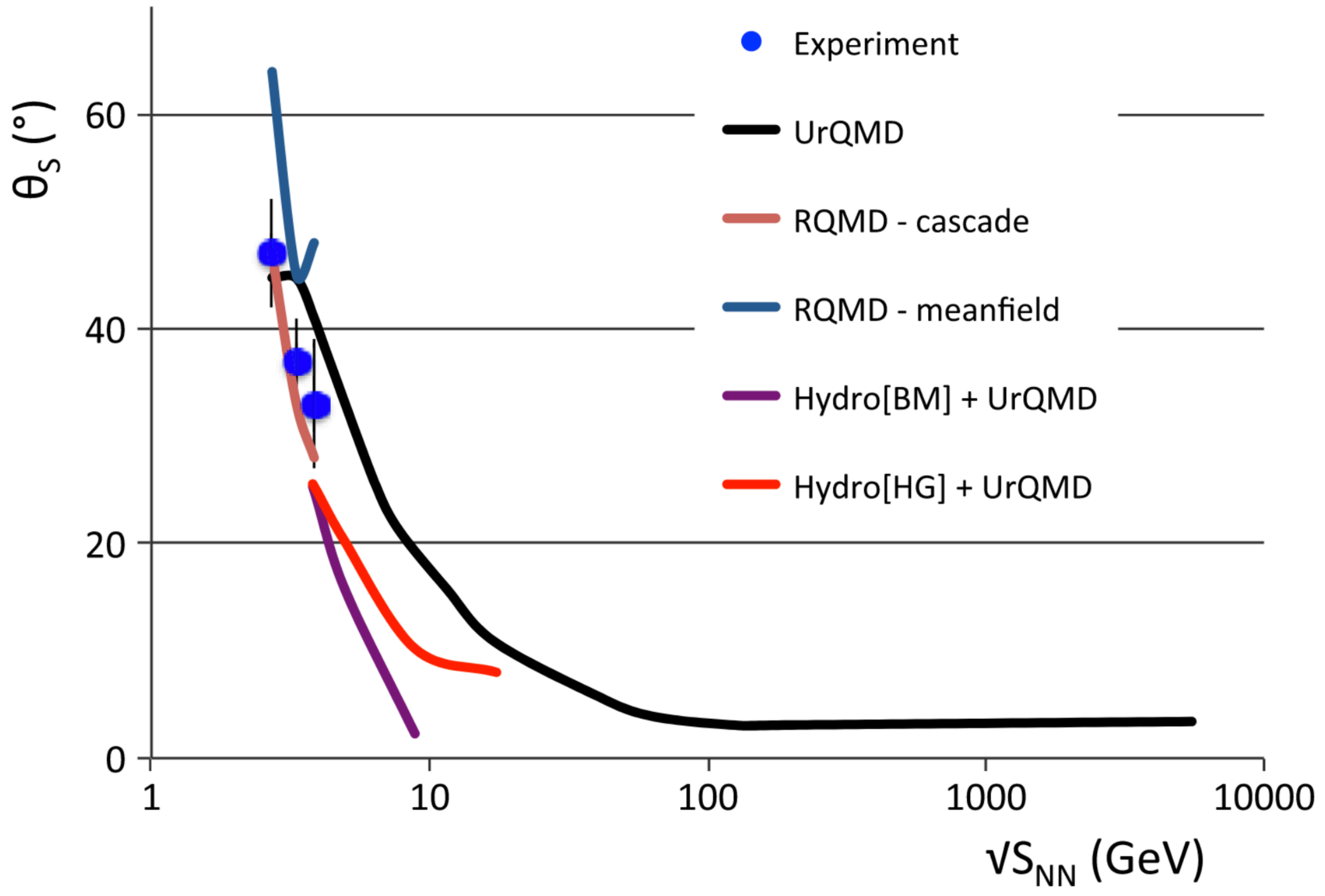
Au + Au 62.4 GeV, charged particle v_1

- Directed flow v_1 ($= \langle\cos(\phi - \Psi_1)\rangle$) is produced due to interaction between spectator and participant particles
- $v_1(\eta)$ is zero three times at around mid, forward and backward rapidities : possible signature of phase transition (J. Brachmann et al. Phys. Rev. C 61 (2000) 024909)
- v_1 can't be explained by hydrodynamical models unlike v_2 or v_3

Femtoscopic studies w.r.t. Ψ_1

- v_1 signal can be generated from assuming the "tilted source" initial conditions
- Femtoscopic measurements w.r.t. Ψ_1 can give the information about tilt angle θ_s





M. A. Lisa et al. New J. Phys. 13 (2011) 065006

Femtoscopic studies w.r.t. Ψ_1

- Fit function for identical particles with cross term:

$$C(q) = N[(1-\lambda) + \lambda K(q_{inv})(1+G(q))]$$

$$G(q) = exp(-R^2_{out}q^2_{out} - R^2_{side}q^2_{side} - R^2_{long}q^2_{long} - R^2_{os}q_{out}q_{side} - R^2_{ol}q_{out}q_{long} - R^2_{sl}q_{side}q_{long})$$

Fit function

$$\begin{cases} R^2_{\mu,0} + 2R^2_{\mu,1}cos(\phi - \Psi_1) + 2R^2_{\mu,2}cos(2(\phi - \Psi_1)), (\mu = o, s, l, ol) \\ R^2_{\mu,0} + 2R^2_{\mu,1}sin(\phi - \Psi_1) + 2R^2_{\mu,2}sin(2(\phi - \Psi_1)), (\mu = os, sl) \end{cases}$$

$$\theta_s = \frac{1}{2}\tan^{-1}\left(\frac{-4R^2_{sl,1}}{R^2_{l,0} - R^2_{s,0} + 2R^2_{s,2}}\right)$$