

Discussion of the CME observables

Goal: identification the presence or the lack of the CME signal at the level of “ ~5% of the gamma correlator”

Clear “list” of the assumptions!
Clear statement what any new observable brings new

$$\langle \cos(\phi_a + \phi_b - 2\Psi_{RP}) \rangle$$

Nature of the background -
RP independent background: mostly back-to-back jets
RP dependent background: “flowing clusters”, anything else?

$$\langle \cos(\phi_a + \phi_b - 2\phi_c) \rangle$$









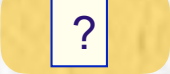
nonzero only due to resonance motion. More accurate estimate could be done with proper simulations of such effects, but the total contribution should be smaller than $\langle \cos(\phi_a + \phi_b - 2\phi_c) \rangle \leq 10^{-3} v_{2,\text{res}} v_{2c}$, where the factor 10^{-3} is coming from the estimates of nonflow azimuthal correlations [7]. Taking all together, one finds the systematic uncertainty in measurements of a_π parameter below one percent level.

Clear definition of what is “flow”

Other “2-particle + RP” observables:

One needs to bring extra information: Where the “magic” comes from?

“Black/white” (“concave/convex”) for the signal/background:
how the transition happens? At what S:B “mixture” the result is “null”?

Observable	(Just a few) names	Problems/questions	My opinion
$\Delta\gamma$ <div style="border: 1px solid black; display: inline-block; padding: 2px;">ESE</div> <div style="border: 1px solid black; display: inline-block; padding: 2px;">ESE "CMS"</div> <div style="border: 1px solid black; display: inline-block; padding: 2px;">"q2obs"ESE</div>	<div style="border: 1px solid black; display: inline-block; padding: 2px;">F. Wang, G. Wang</div>	<div style="border: 1px solid black; display: inline-block; padding: 2px;">Dependence of the signal on v_2?</div> <div style="border: 1px solid black; display: inline-block; padding: 2px;">"Play" on stat. fluctuations, Not-interpretable?</div>	  
<div style="border: 1px solid black; display: inline-block; padding: 2px;">small systems</div>	<div style="border: 1px solid black; display: inline-block; padding: 2px;">CMS, F. Wang, others</div>	<div style="border: 1px solid black; display: inline-block; padding: 2px;">Strong RP independent background, nothing/little to say about CME</div>	
<div style="border: 1px solid black; display: inline-block; padding: 2px;">Mixed harmonics</div>	<div style="border: 1px solid black; display: inline-block; padding: 2px;">Voloshin, CMS, many others</div>	<div style="border: 1px solid black; display: inline-block; padding: 2px;">Requires detailed knowledge about the kinematic of the cluster decays (as e.g. pT)</div>	
<div style="border: 1px solid black; display: inline-block; padding: 2px;">invariant mass</div>	<div style="border: 1px solid black; display: inline-block; padding: 2px;">F. Wang, J. Zhao</div>	<div style="border: 1px solid black; display: inline-block; padding: 2px;">Requires knowledge of the inv. mass spectrum of "sphaleron" decays</div>	
<div style="border: 1px solid black; display: inline-block; padding: 2px;">Spectator /participant EP</div>	<div style="border: 1px solid black; display: inline-block; padding: 2px;">F. Wang, J. Zhao</div> <div style="border: 1px solid black; display: inline-block; padding: 2px; margin-left: 100px;">S. Voloshin</div>	<div style="border: 1px solid black; display: inline-block; padding: 2px;">Promising with careful treatment of contributions to v_2 and gamma</div>	
$\Delta\gamma, \Delta\delta; H, F, \kappa$	<div style="border: 1px solid black; display: inline-block; padding: 2px;">J. Liao, G. Wang, et al</div>	<div style="border: 1px solid black; display: inline-block; padding: 2px;">No strict justification => imprecise</div>	
<div style="border: 1px solid black; display: inline-block; padding: 2px;">"Balance function"</div>	<div style="border: 1px solid black; display: inline-block; padding: 2px;">A. Tang</div>	<div style="border: 1px solid black; display: inline-block; padding: 2px;">"General" questions from previous page</div>	
ΔS	<div style="border: 1px solid black; display: inline-block; padding: 2px;">R. Lacey</div>	<div style="border: 1px solid black; display: inline-block; padding: 2px;">"General" questions from previous page</div>	