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## A new correlator for the detection and characterization of the Chiral Magnetic Effect

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A charge-sensitive in-event correlator ( $R(\Delta S)$ ) is proposed and tested for its efficacy to detect and characterize charge separation associated with the Chiral Magnetic Effect (CME) in heavy ion collisions-[1]. For CME-driven charge separation, the correlator gives a concave response relative to the second-order event plane ( $\Psi_2$ ), and a null response relative to the third-order plane ( $\Psi_3$ ), consistent with the correlation (de-correlation) of the  $\vec{B}$ -field with the  $\Psi_2$  ( $\Psi_3$ ) plane. For non-CME background, the correlator gives responses, relative to  $\Psi_2$  and  $\Psi_3$ , which allows a distinction between CME-driven charge separation and non-CME backgrounds. We discuss the  $R(\Delta S)$  correlator and present results for its detailed response and sensitivity, to both signal and background, in several reaction models. They include (but are not limited to) a 3+1-dimensional hydrodynamic model [2], the Anomalous Viscous Fluid Dynamics (AVFD) model [3] and the Multi-Phase Transport model (AMPT) [4]. The implications for the use of the  $R(\Delta S)$  correlator in the upcoming Iso-bar Run at RHIC will also be discussed.

[1] N. Magdy, S. Shi, J. Liao, N. Ajitanand, and R. A. Lacey, arXiv:1710.01717

[2] P. Bozek, arXiv:1711.02563

[3] S. Shi, Y. Jiang, E. Lilleskov, J. Liao, arXiv:1711.02496

[4] Lin Z W et al. Phys.Rev. C72 064901 (2005)

### Content type

Experiment

### Collaboration

### Centralised submission by Collaboration

Presenter name will be specified later

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