



# First performance results of the sPHENIX Event Plane Detector

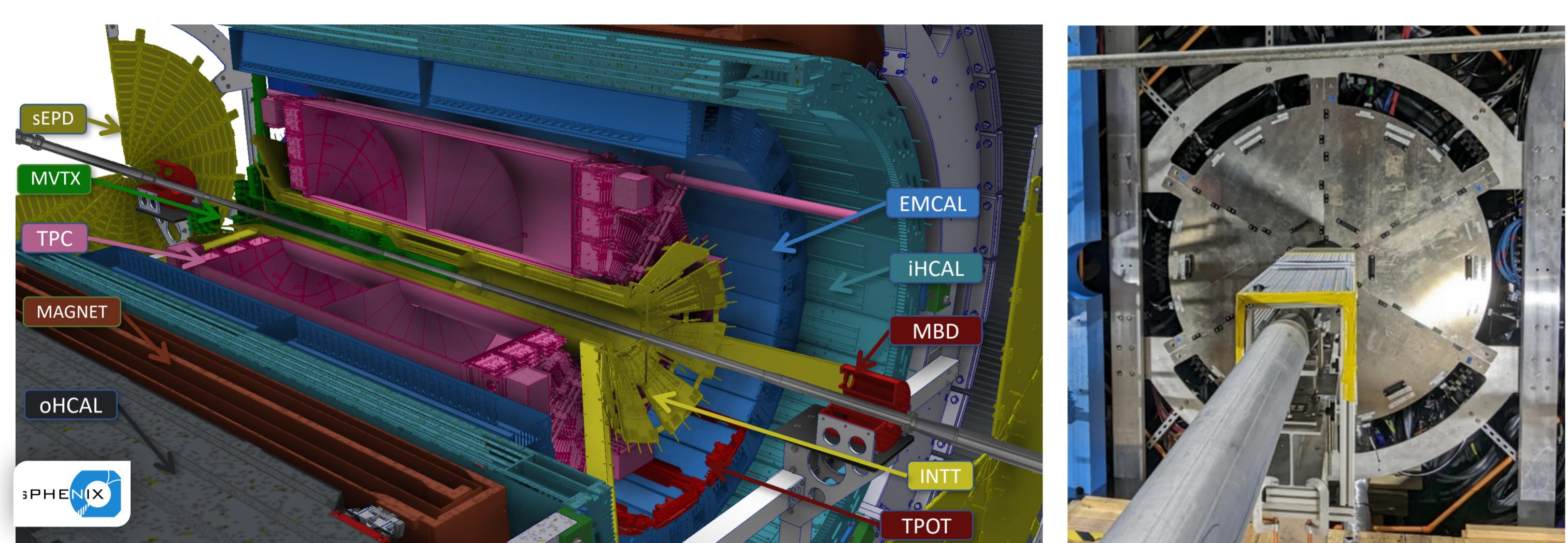


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## Introduction

### The sPHENIX Event Plane Detector (sEPD)

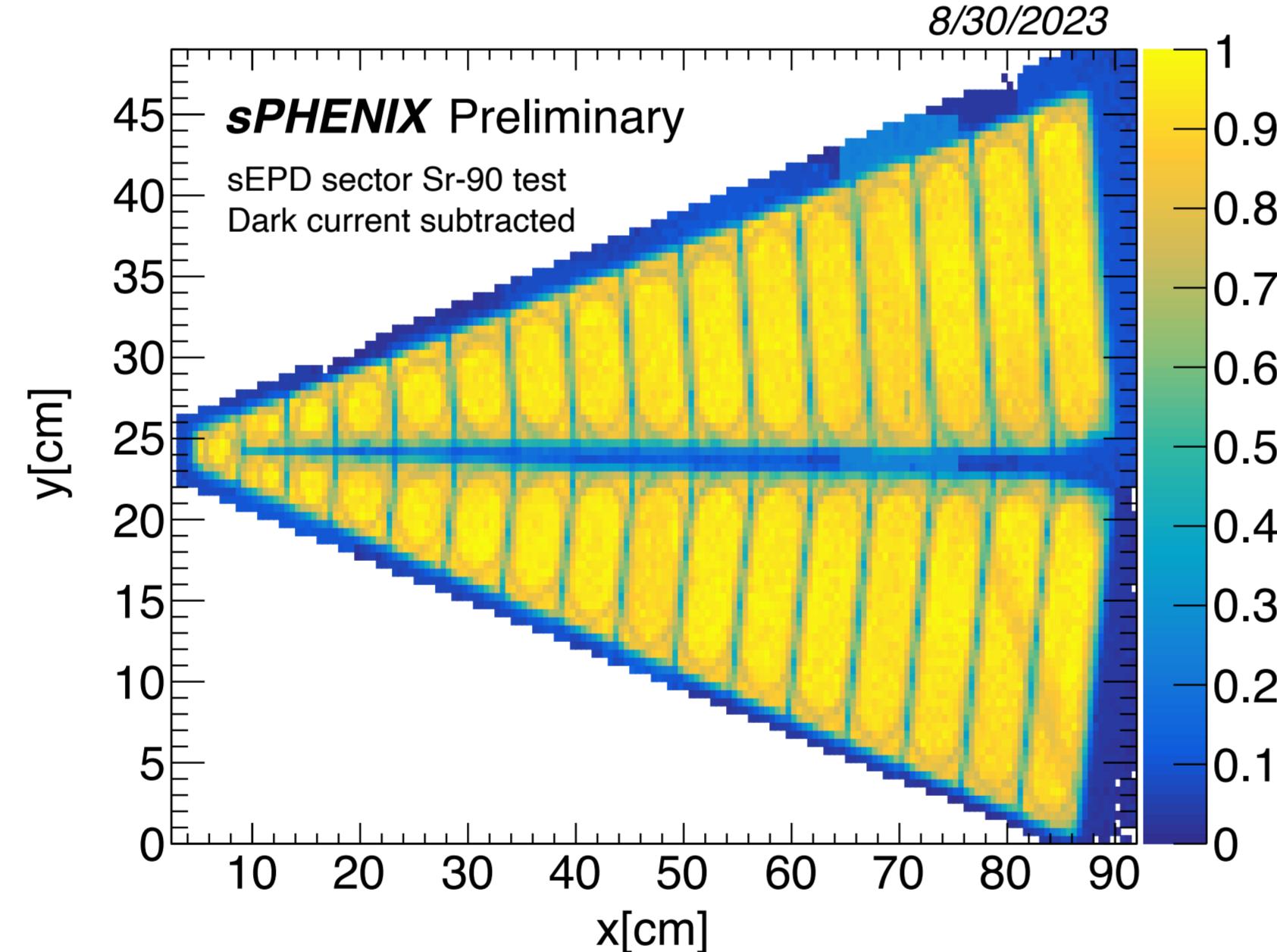
- Covers both forward and backward rapidity region in  $2.1 < |\eta| < 4.9$
- 12 sectors for each side — one sector subdivided into 31 tiles
- Total 744 channels with 16 segments in  $\eta$  and 24 in  $\phi$
- Essential role for event plane determination with high resolution
- Construction and installation : See poster from Valerie Wolfe (505)



## Pre-installation tests

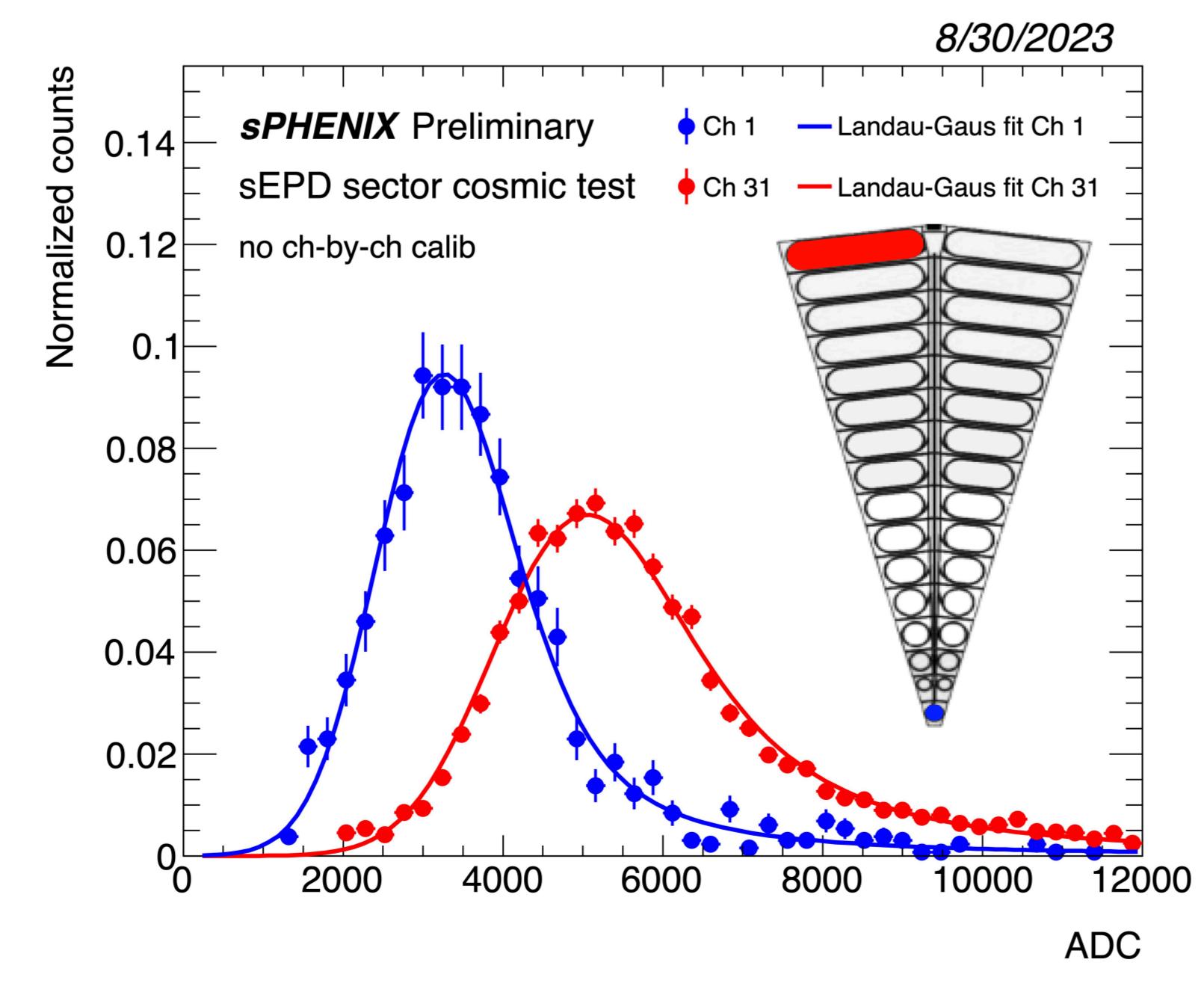
### Sr-90 sector test

- Consistency test using Sr-90 source at CU Boulder
- Position scan in xy plane in units of 0.5cm
- Dark current subtracted and normalized to signal height
- Uniform distribution throughout all channels in each sector



### Cosmic test

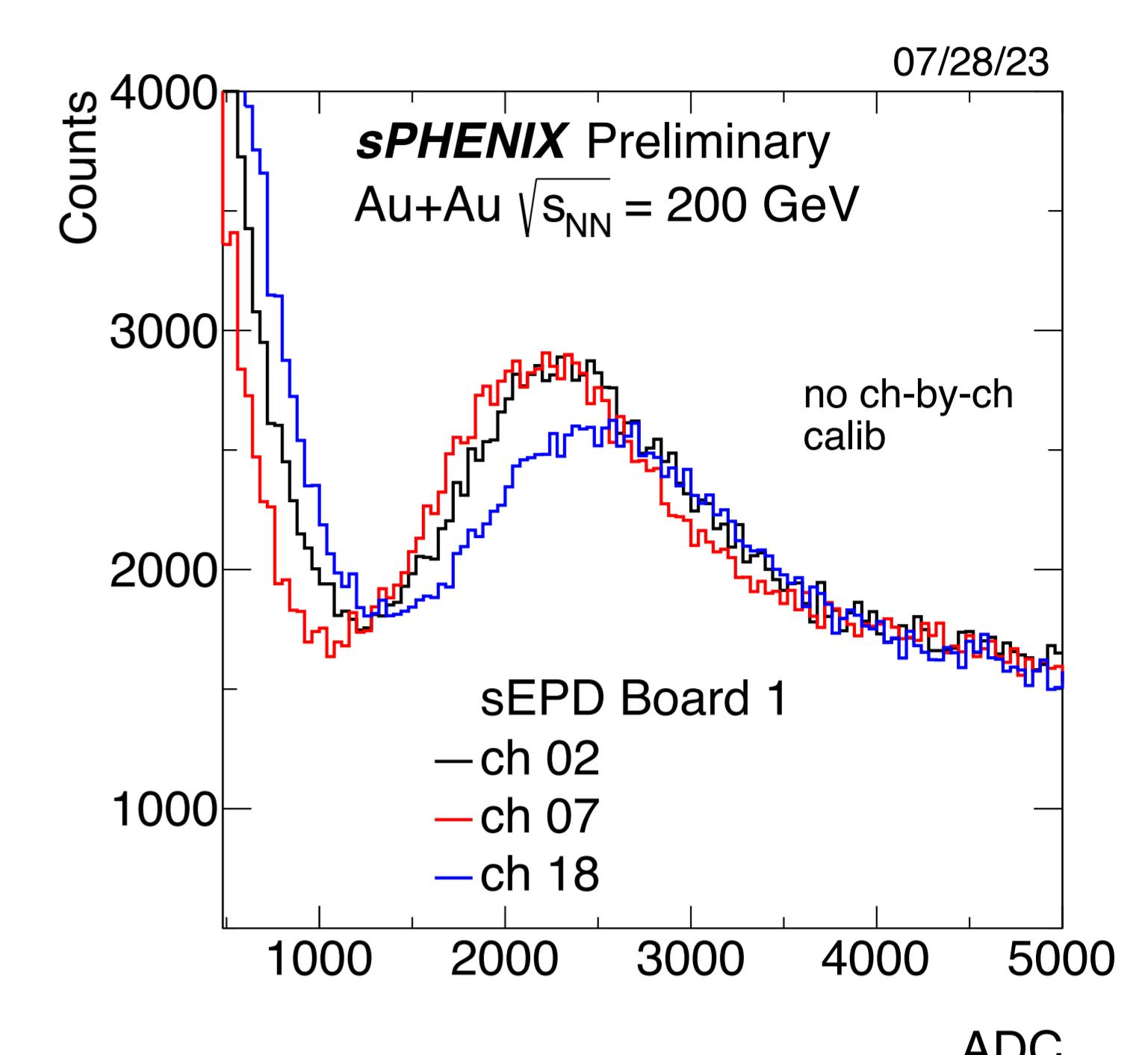
- Cosmic muon test at BNL
- Verification of the MIP peak on each individual channel
- Well described by the Landau-Gaussian convoluted function



## Performance in Run 2023

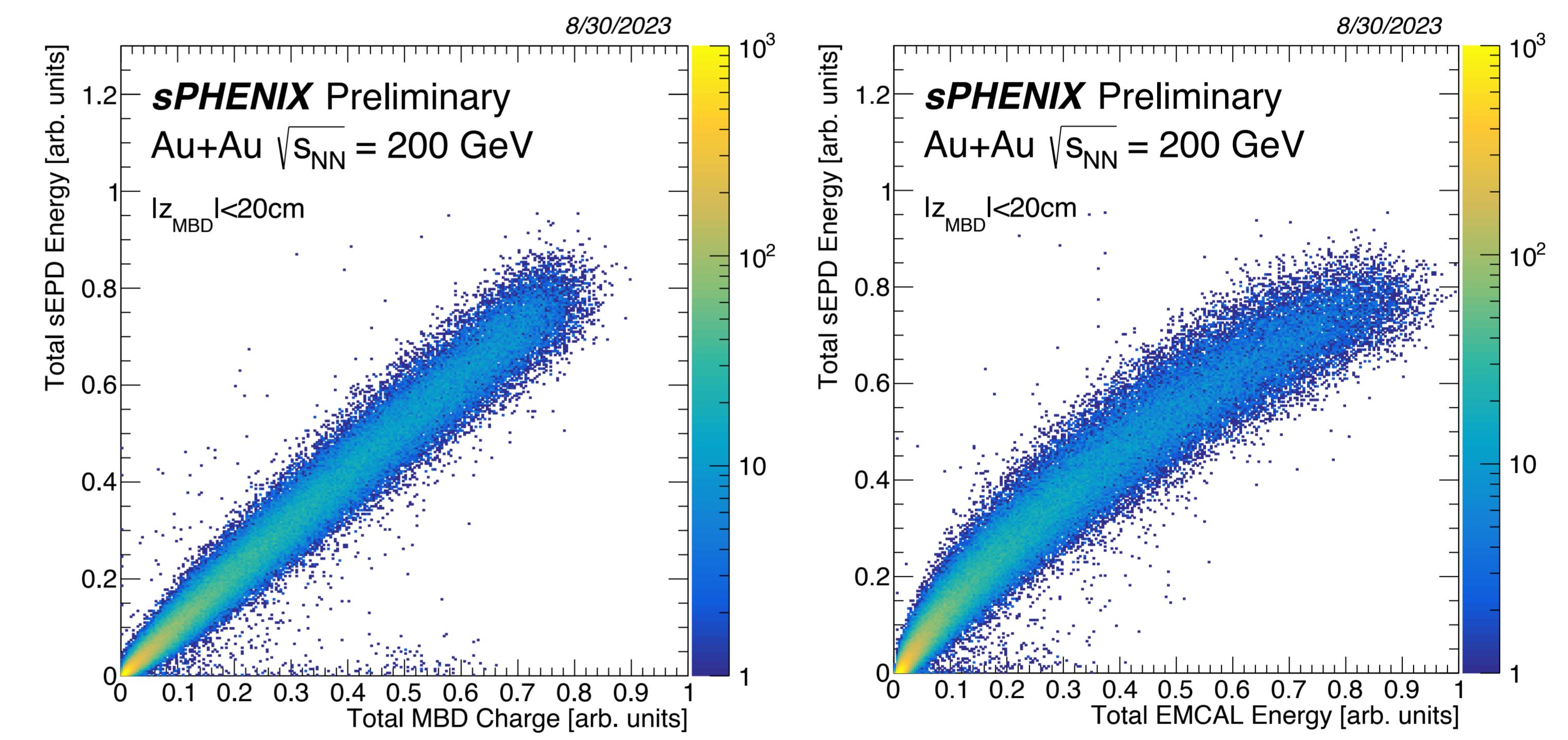
### MIP peak

- MIP peak characterization using test readout electronics
- Clear identification of MIP peak in Au + Au collisions
  - To be used for calibration and multiplicity calculation



### Correlation with other sub-detectors

- Total sEPD energy vs Total MBD charge ( $3.5 < |\eta| < 4.6$ )
- Total sEPD energy vs Total EMCAL energy ( $0 < |\eta| < 1.1$ )
- Evident correlation with sub-detectors in both mid- and forward- $\eta$



## Rapidity dependent correlation

### Pseudorapidity dependence on correlations

- Decrease of linearity with EMCAL (mid- $\eta$ ) towards forward- $\eta$
- Narrower  $\eta$  distribution of particles for central Au+Au events
- Qualitatively similar behavior observed in HIJING simulation

