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Charge measurement of cosmic rays by Plastic Scintillantor Detector of DAMPE

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on behalf of **DAMPE** Collaboration

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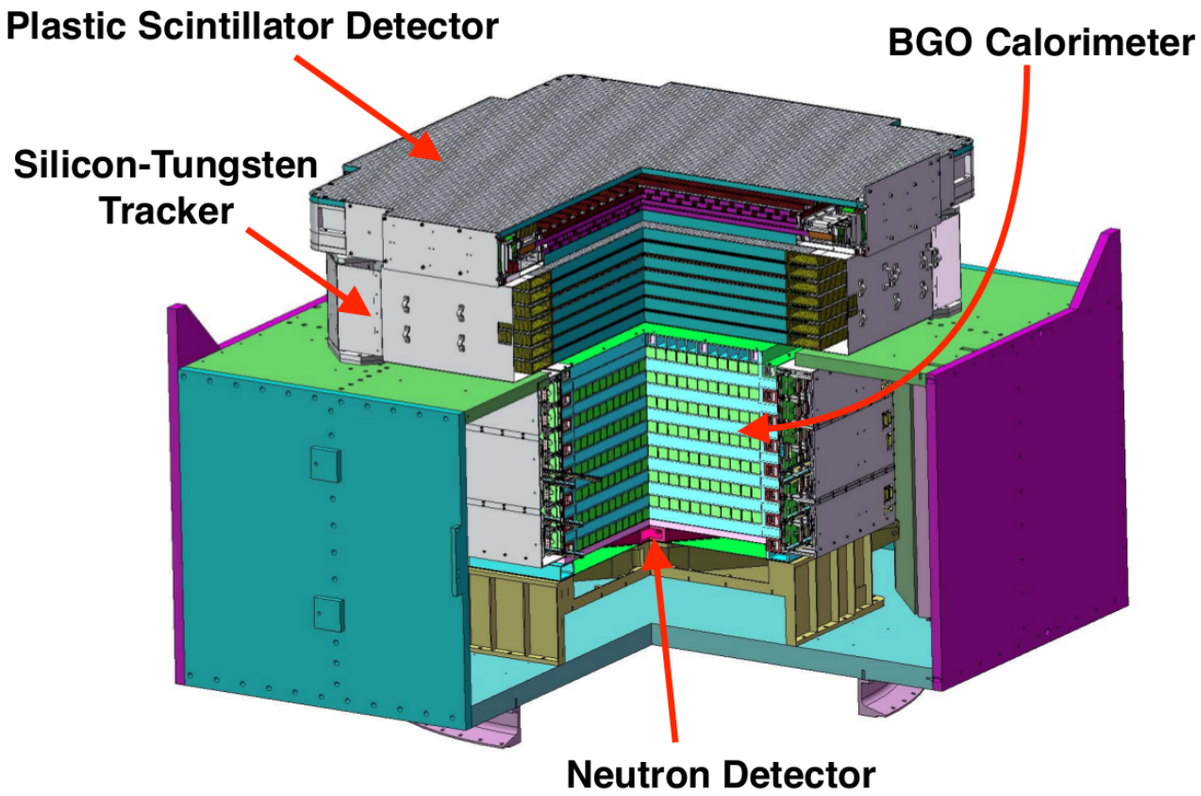
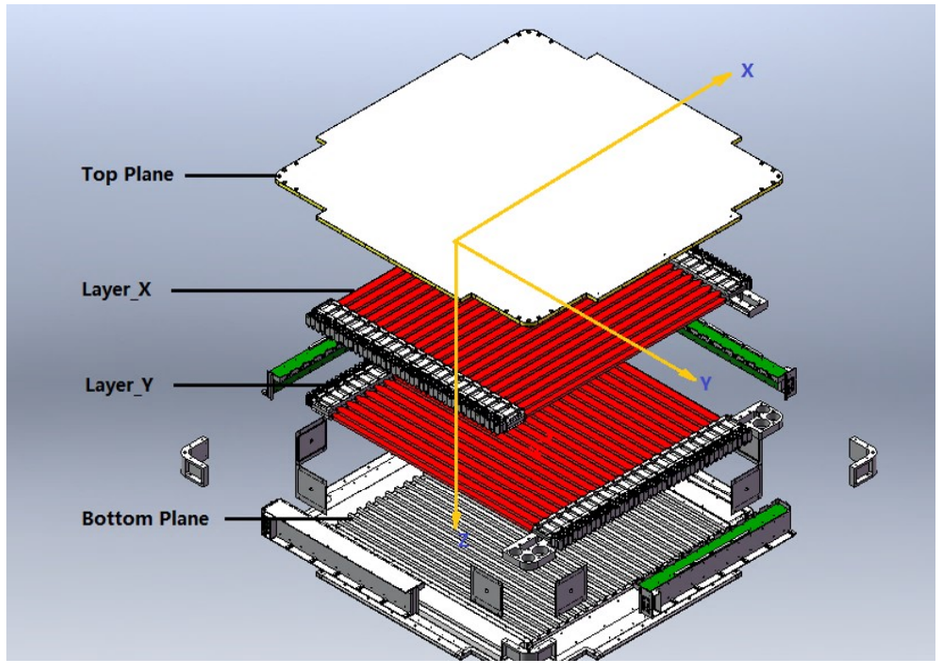
DAMPE

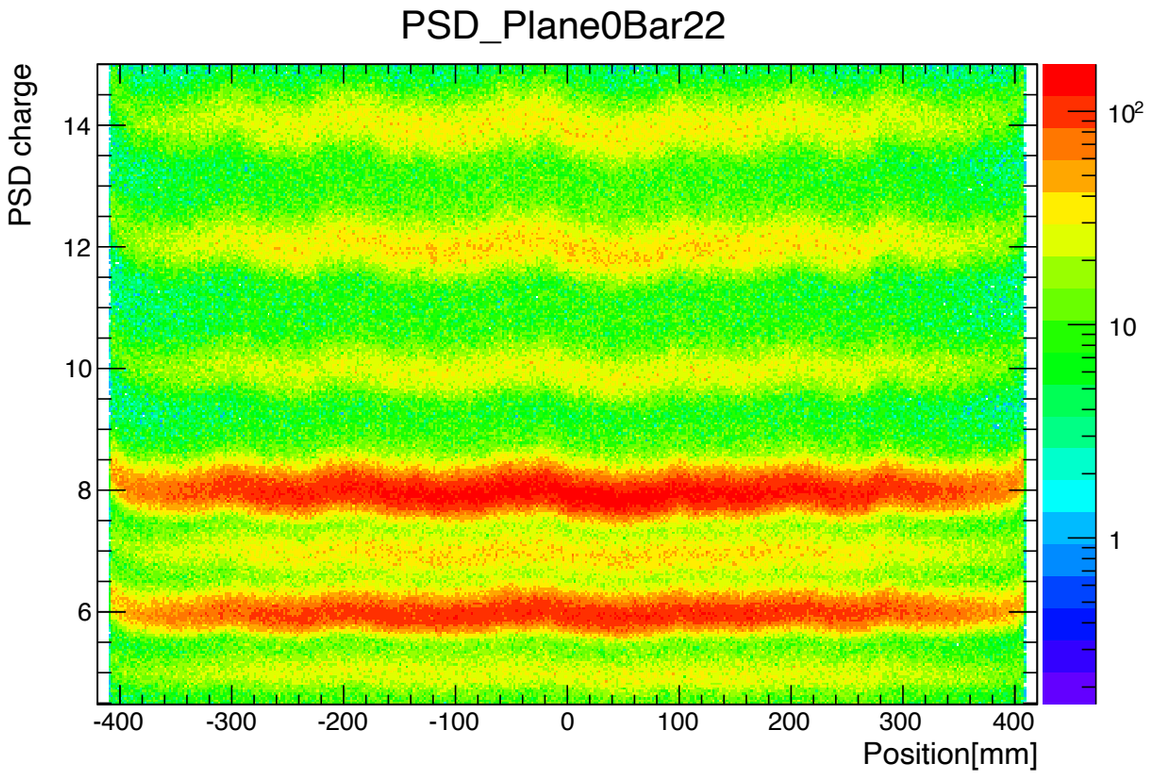
- DAMPE has been working for 5.5 years since launched

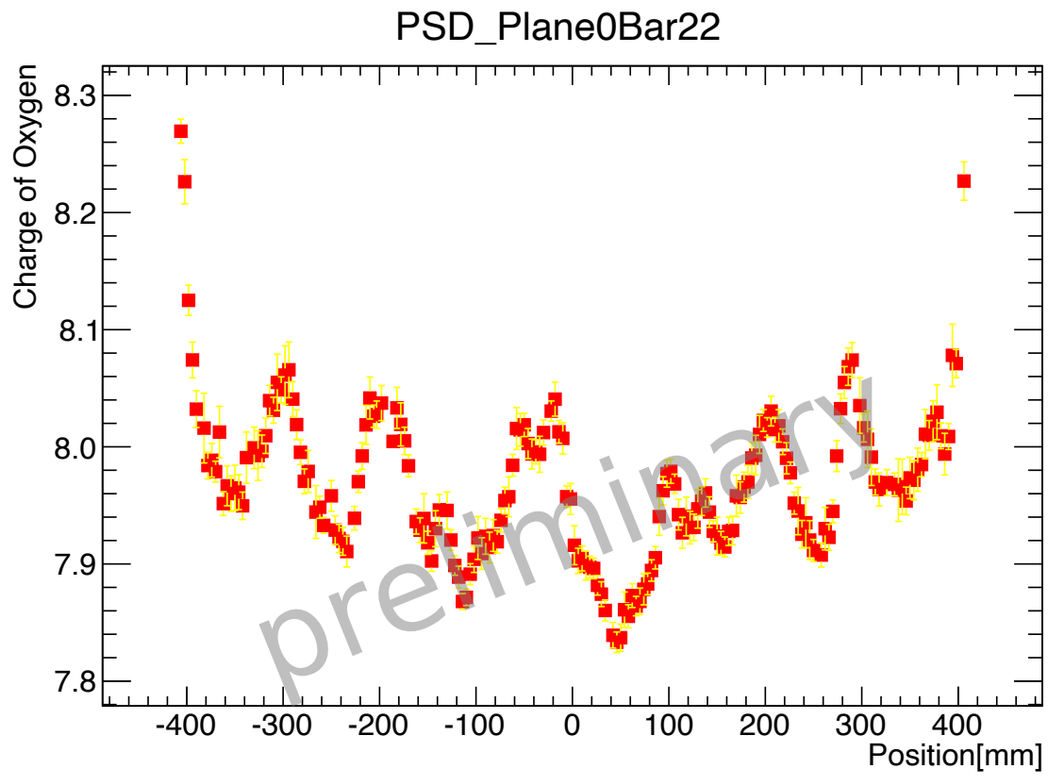




- PSD is composed of two orthogonal planes, with 41 units in each plane.

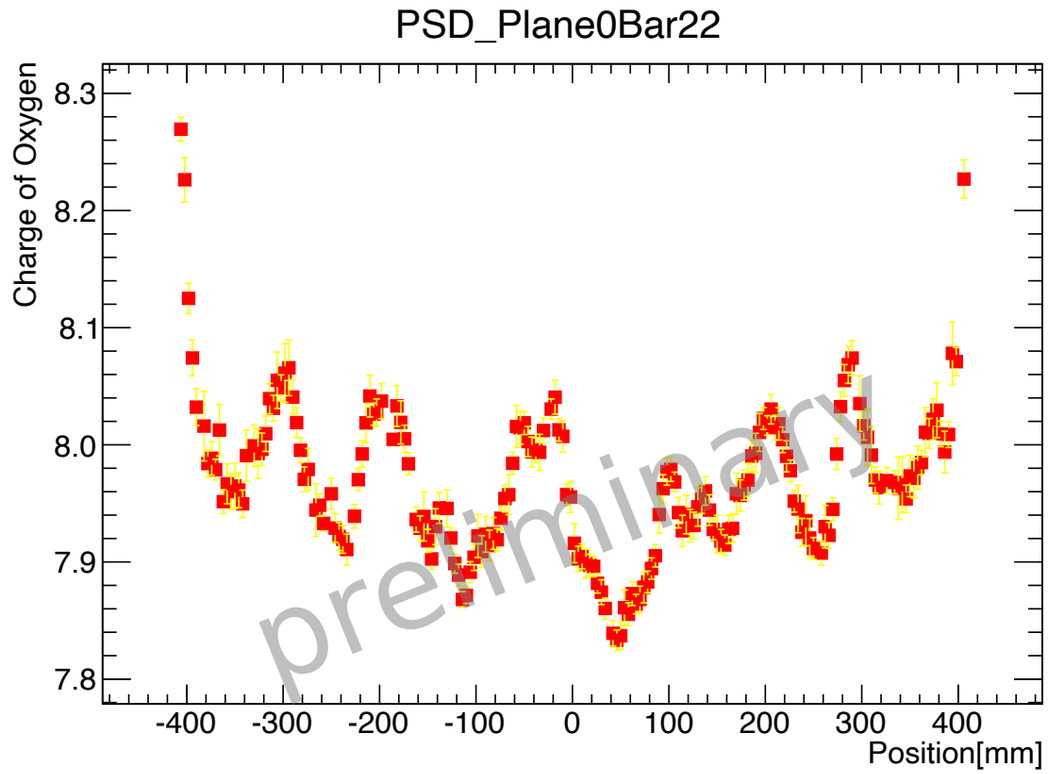
- We developed some dedicated calibration method for improvement of charge measurement for PSD: light attenuation, detector alignment, quenching and equalization correction





- Now, we developed a position correction with oxygen candidates

What does cause the abnormal issue?

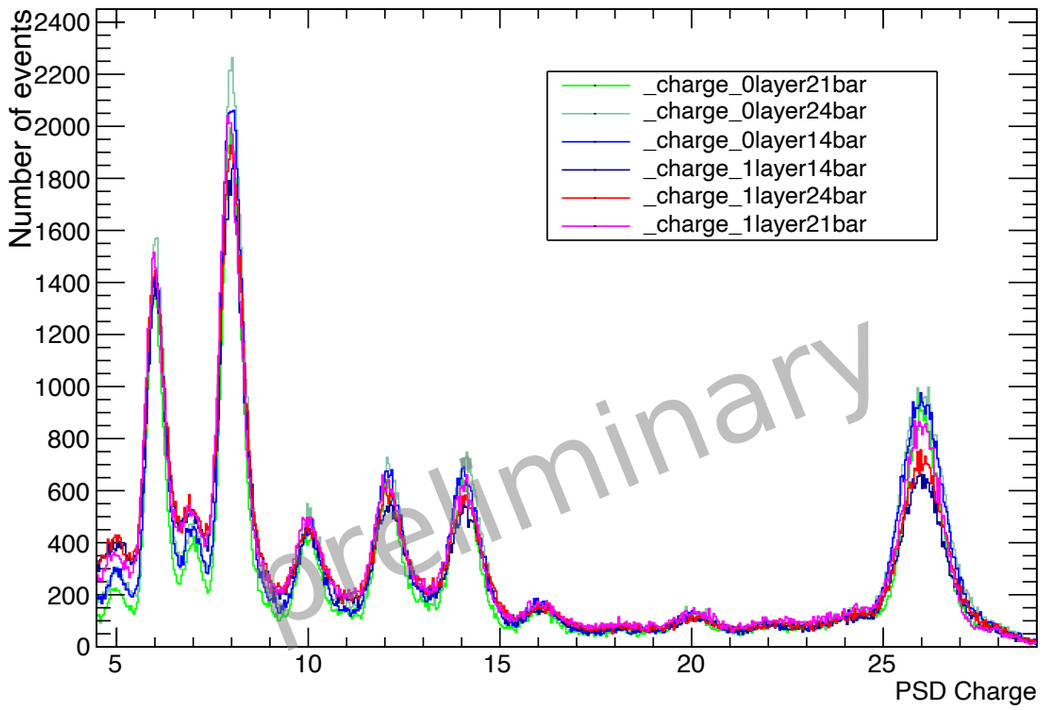


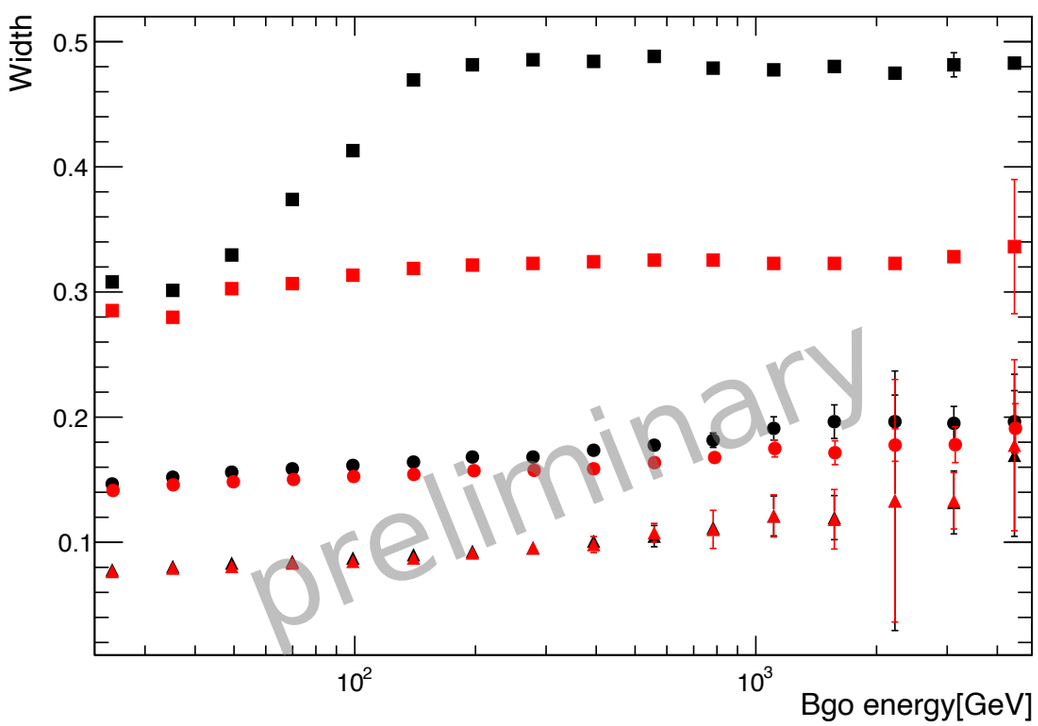
- This feature is due to that light reflection material Tyvek paper did not attach to the surface of scintillator bar uniformly

Correction

$$Z_{\text{psd,after correction}} = \frac{8}{Z(\text{hit position})_{\text{O,template}}} \times Z_{\text{before correction}}$$

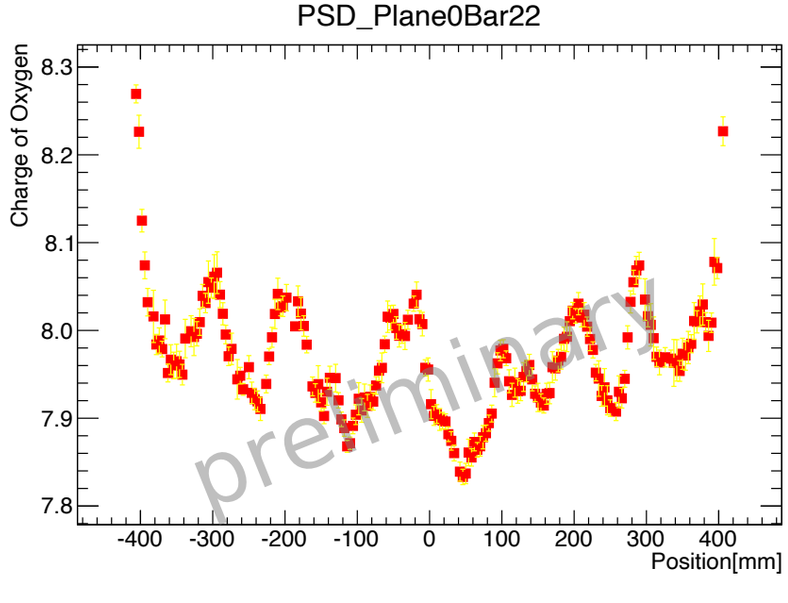
- New PSD charge reconstruction is done by means of all necessary calibration method.

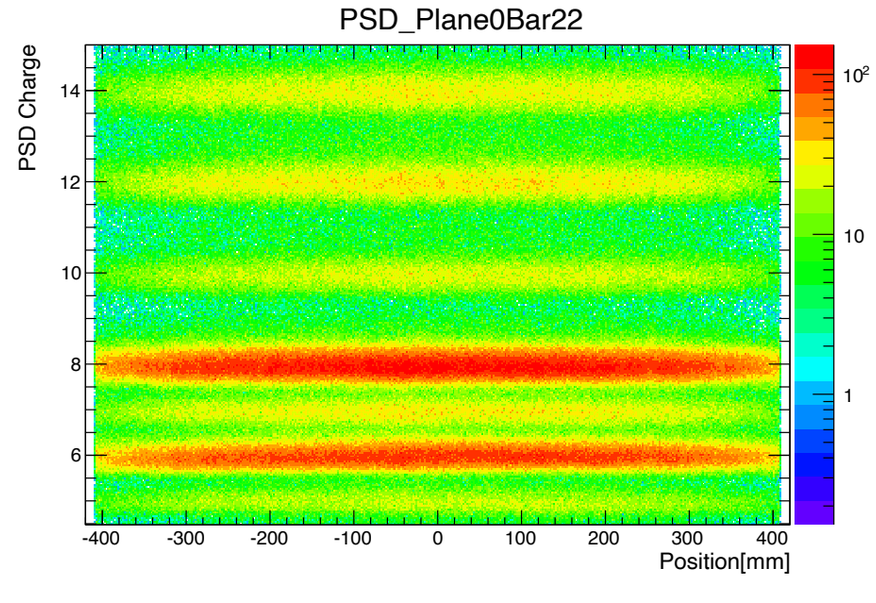


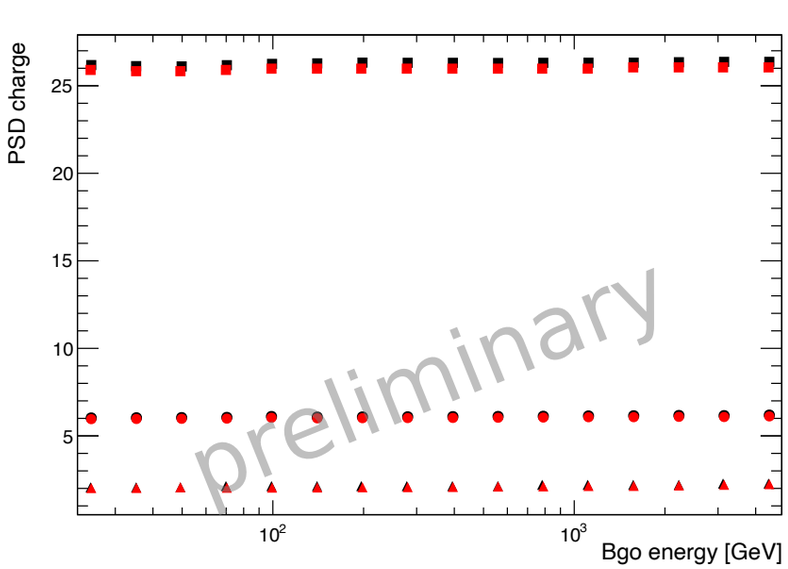


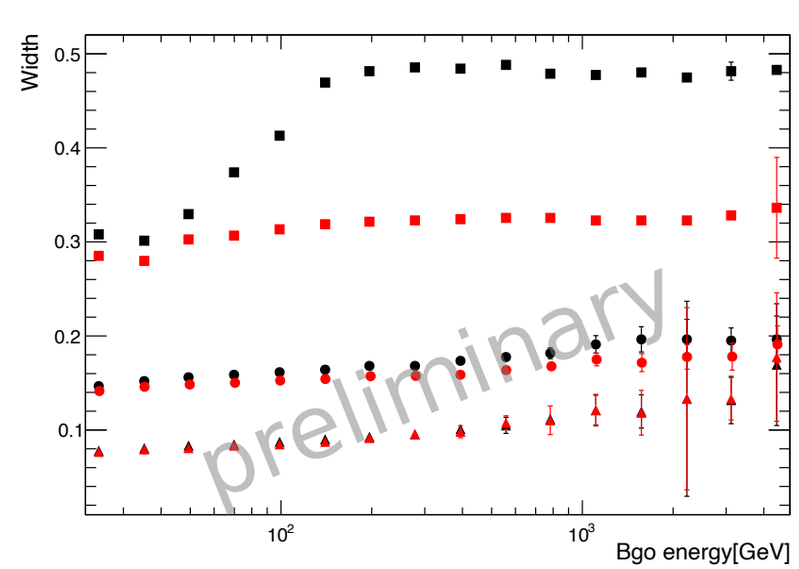
- **This correction is significant for heavy nuclei.**

Summary









- **We eliminate PSD charge variation versus hit position, the correction is helpful to measure the spectra of GCR heavy components.**