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Alignment of the BESIII end cap TOF system

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The end cap time-of-flight (ETOF) at Beijing Spectrometer (BESIII) was upgraded with multi-gap resistive plate chamber technology in order to improve the particle identification capability. The accurate knowledge of the detector real misalignment is important for getting close to the designed time resolution and the expected reconstruction efficiency of the end cap time-of-flight system. The incident position of charged track is extrapolated from multilayer drift chamber to the end cap time-of-flight detector based on the ideal geometry. The raw measured time difference between the two readout channels of one strip could be used to derive an incident position of the charged track using the transmission velocity of the signal in the readout strip, this position is obtained from the response of the detector, without any geometric hypothesis. A software is developed using the comparison between these two positions to provide the spatial position difference between the real detector and the ideal location. The procedure developed towards the alignment and the geometry is updated based on the result of the alignment. The time resolution and reconstruction achieved in recent years are also described in this talk.

Consider for promotion

No

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