



Institute of High Energy Physics
Chinese Academy of Sciences

ATLAS ITk Strip beam test and simulation

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DESY FH fellows meeting
27th February 2018

About Me

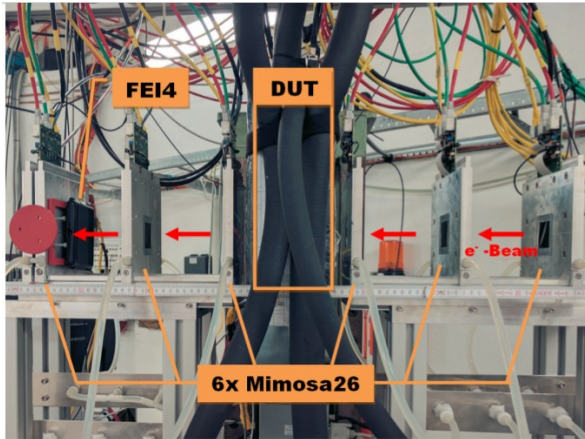
- Born and grew up in Hubei Province, China
- Undergraduate Study in Physics at Central China Normal University, Wuhan, China (2007-2011)
- PhD at Institute of High Energy Physics , Chinese Academy of Sciences, Beijing, China (2011-2016)
 - Partial Wave Analysis of $J/\psi \rightarrow \gamma \phi \phi$ at BESIII
 - Search for $Y(4260)$ in $e^+e^- \rightarrow J/\psi \eta \pi^0$ and $pp\bar{p}\pi^0$ at BESIII
- ONACPR fellow at DESY from Feb. 2017, working on ITk Strip Detector of ATLAS Upgrade



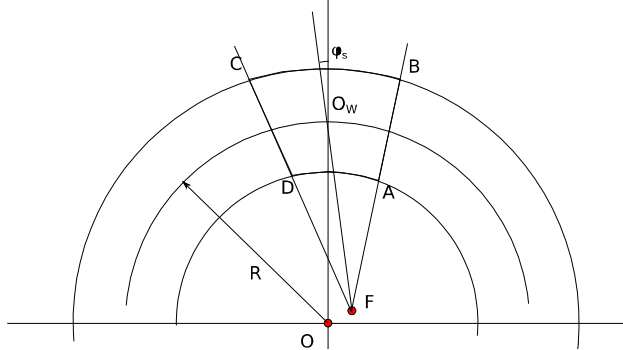
My Current Work

Testbeam data reconstruction&analysis

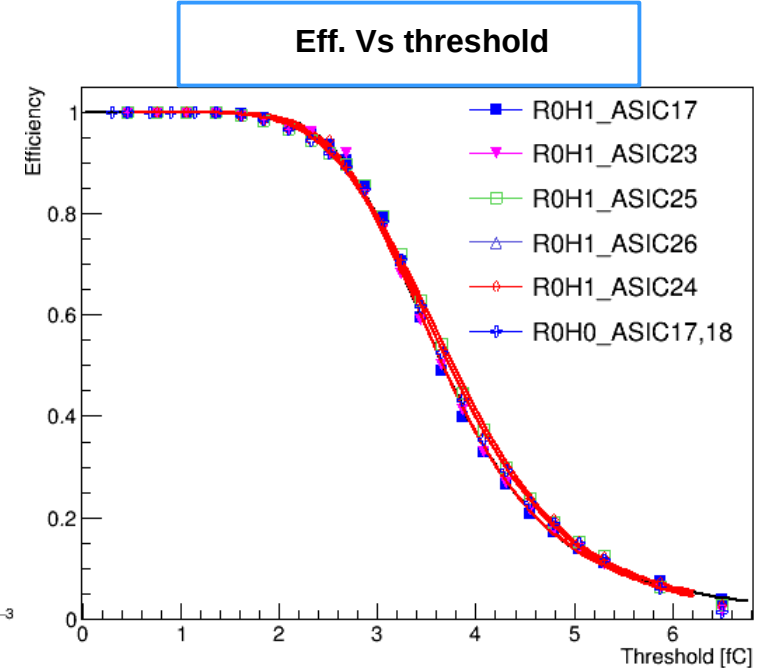
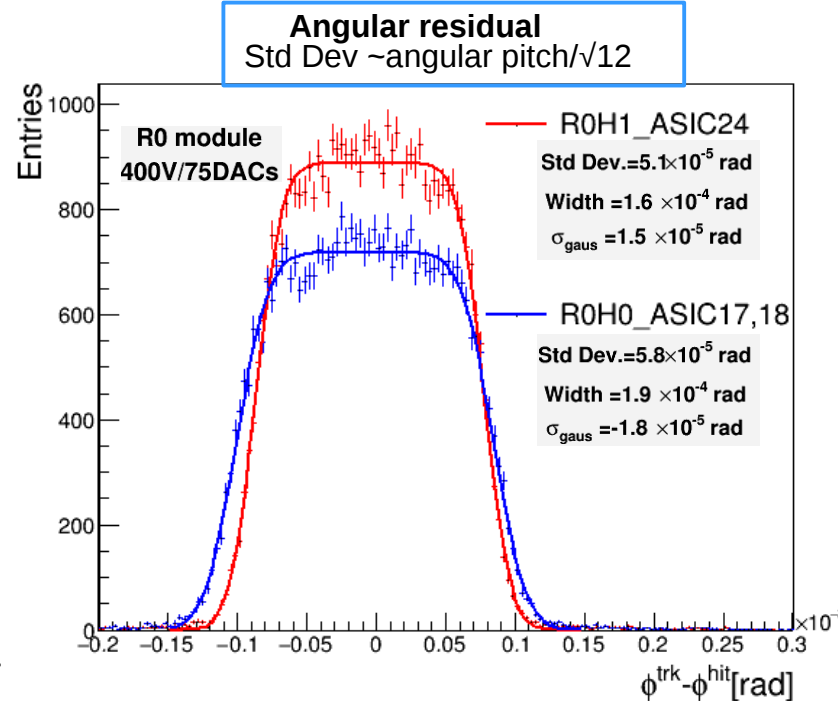
EUDET-type beam-telescope



R0 module:
stereo-Annulus shape



- Testbeam of Strip sensor with various strip shapes:
 - Barrel Short/Long Strip module: rectangular strips
 - Endcap R0 module: stereo-Annulus radial strips
- EUTelescope software
 - used to do reconstruction of telescope beam test data
 - cannot deal with non-rectangular shape strips
 - developed to make the reconstruction of sensor with radial strips possible



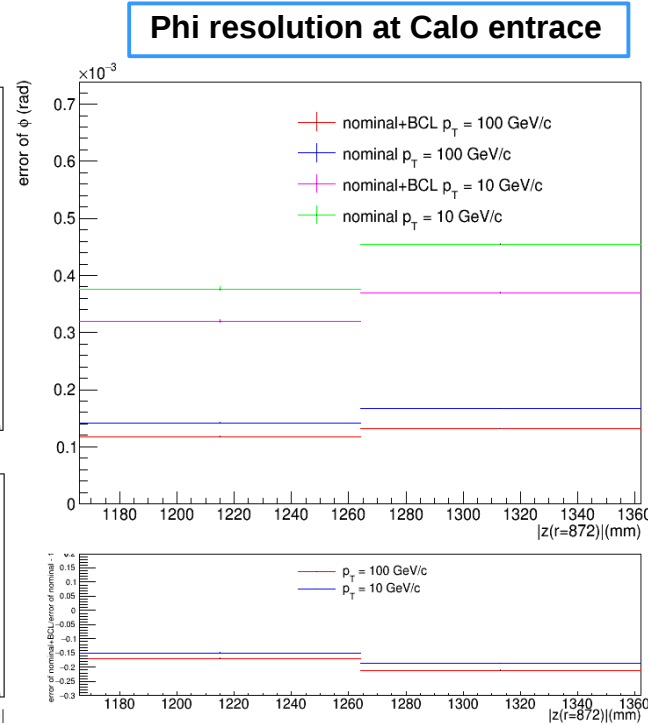
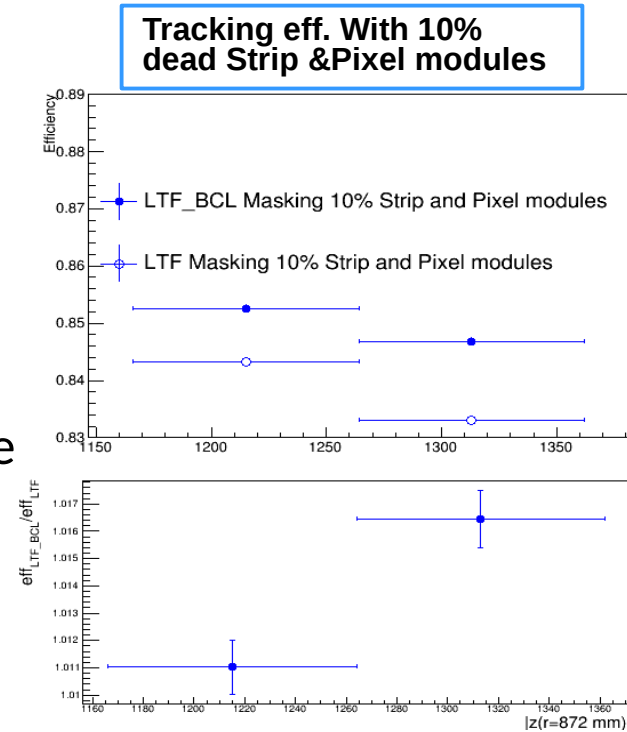
My Current Work

ITk Performance with BCL and ReadoutGeometry software development

- Studies of ITk performance with BCL
 - Improvement in p_T resolution
 - Improvement in tracking efficiency
 - evaluate the effects of dead strips/modules
 - Improvement in calorimeter matching precision
- Software clean up and development of the ID/ITk Readout Geometry
 - Split up for subdetectors (Pixel, SCT/Strip and TRT)
 - Remove redundant methods, to vastly simplify the code
 - Other necessary clean-up

Barrel Completion Layer (BCL):

Proposed extra layer between ITk Strip B2 and B3 to cover the barrel endcap gap



My Favourite Plots

From PhD research:
Partial Wave Analysis of $J/\psi \rightarrow \gamma \phi \phi$ at BESIII

- Lattice QCD predictions
 - ground state of 2^{++} glueball in 2.3 ~2.4 GeV
 - ground state of 0^{-+} glueball in 2.3~2.6 GeV
- The radiative decay channel of J/ψ meson is one of the most promising hunting grounds for glueballs
- The new experimental results are helpful for mapping out the pseudoscalar excitations and searching for 0^{-+} glueball
 - Dominant contribution from pseudoscalars; $\eta(2225)$ is confirmed; while two additional pseudoscalars $\eta(2100)$ and $X(2500)$ are observed.
 - The three tensors $f_2(2010)$, $f_2(2300)$ and $f_2(2340)$ stated in $\pi\pi$ reactions are also observed in $J/\psi \rightarrow \gamma \phi \phi$ with a strong production of $f_2(2340)$

