EIC dRICH simulations - beam pipe study

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On behalf of ePIC collaboration

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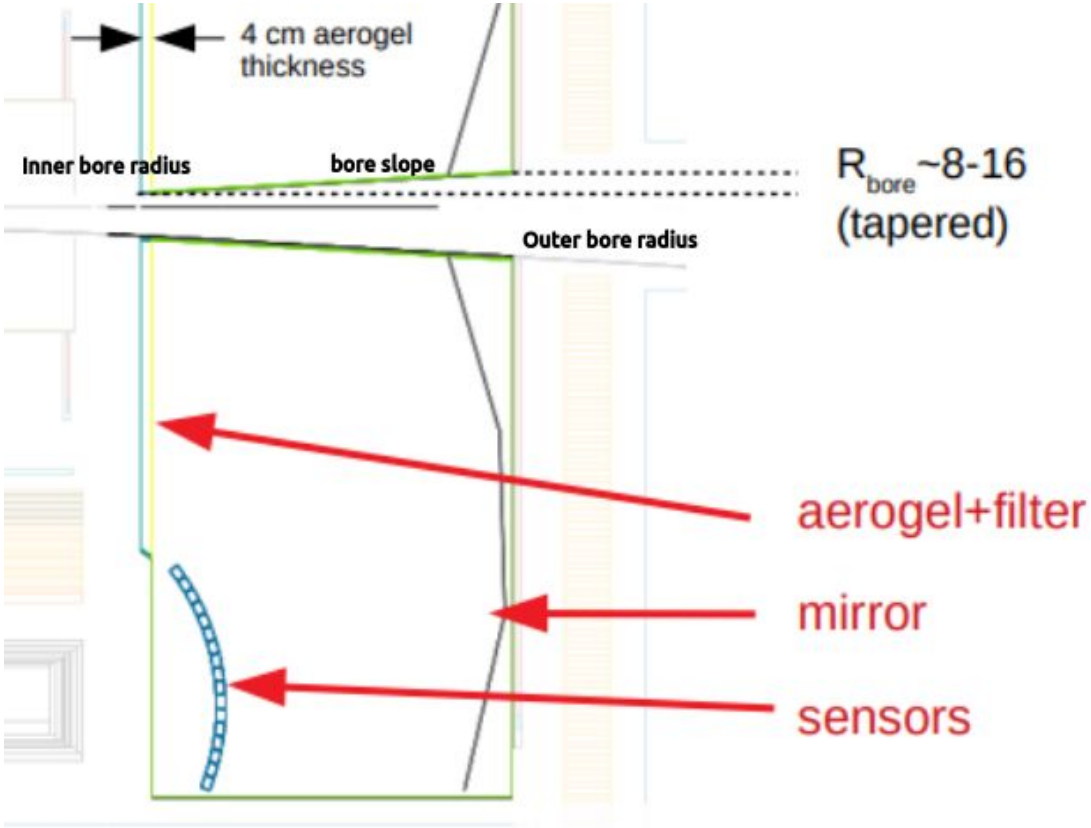
Structure and dimensions of beam pipe



Beam pipe dimensions

- Inner bore radius = 8.621cm
- Outer bore radius= 15.478cm
- Bore slope =0.057

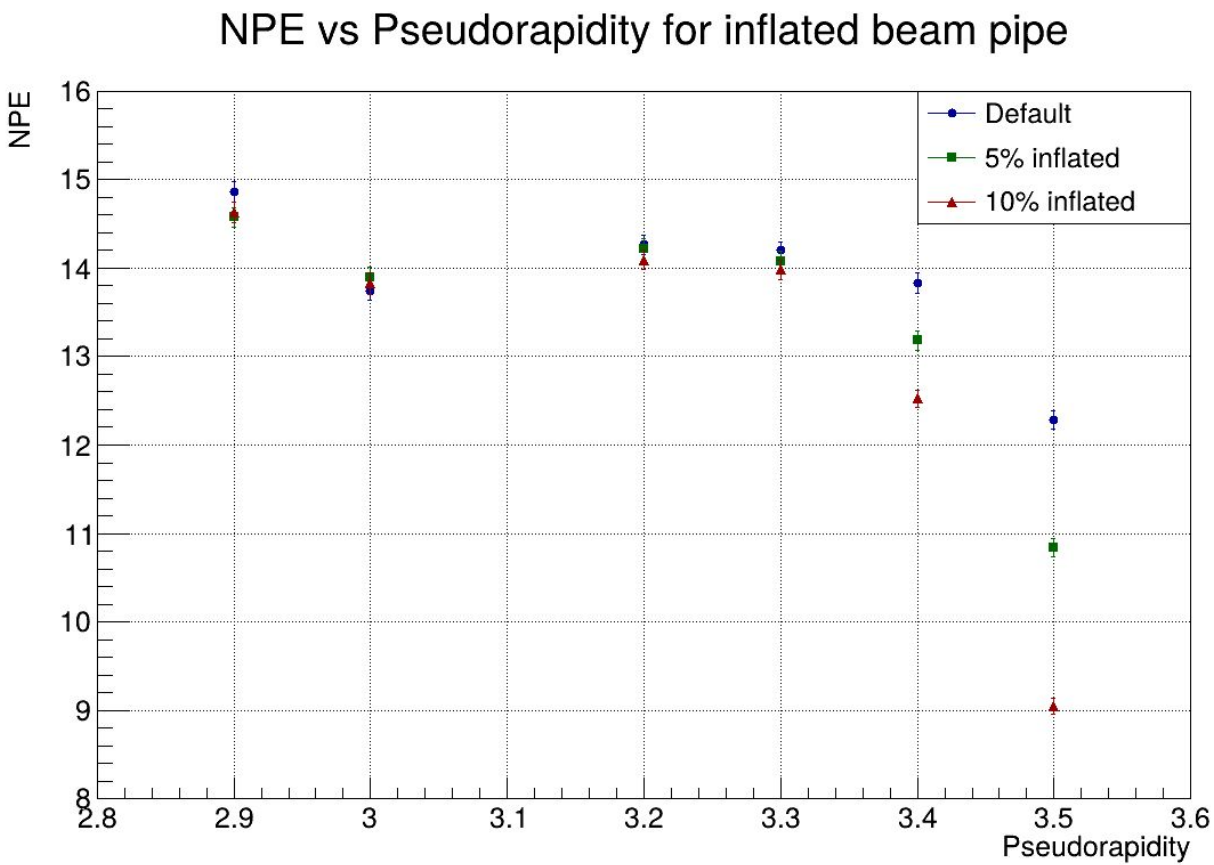
Investigate the effects of beam pipe inflation on detector performance particularly in high pseudorapidity regions.

Current study is for:

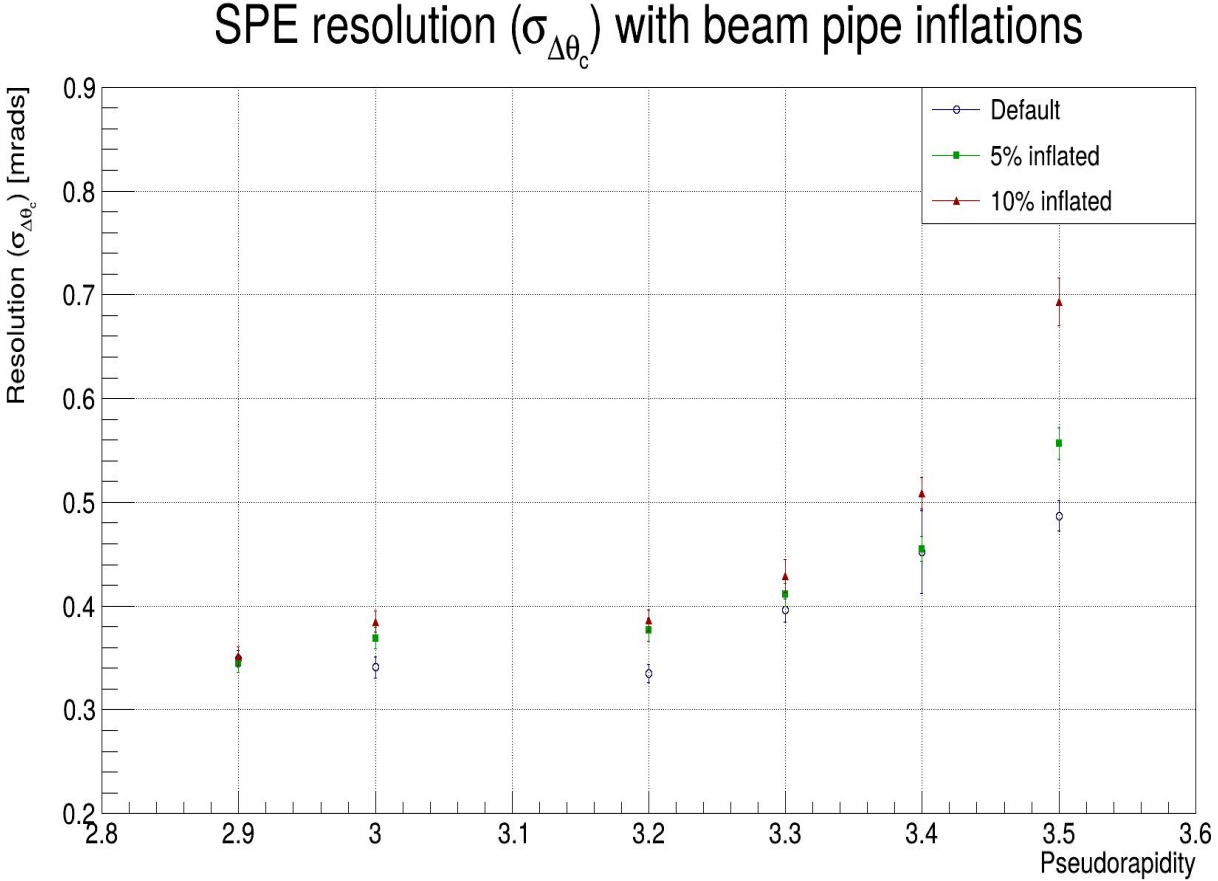
- Momentum 42 GeV
- n = 1000
- Particle Pion-
- b from 2.9 to 3.5
- Outer bore radius -
    - Default - 15.478 cm
    - Inflated 5% - 16.252 cm
    - Inflated 10% - 17.026 cm

Key Parameters Analyzed:

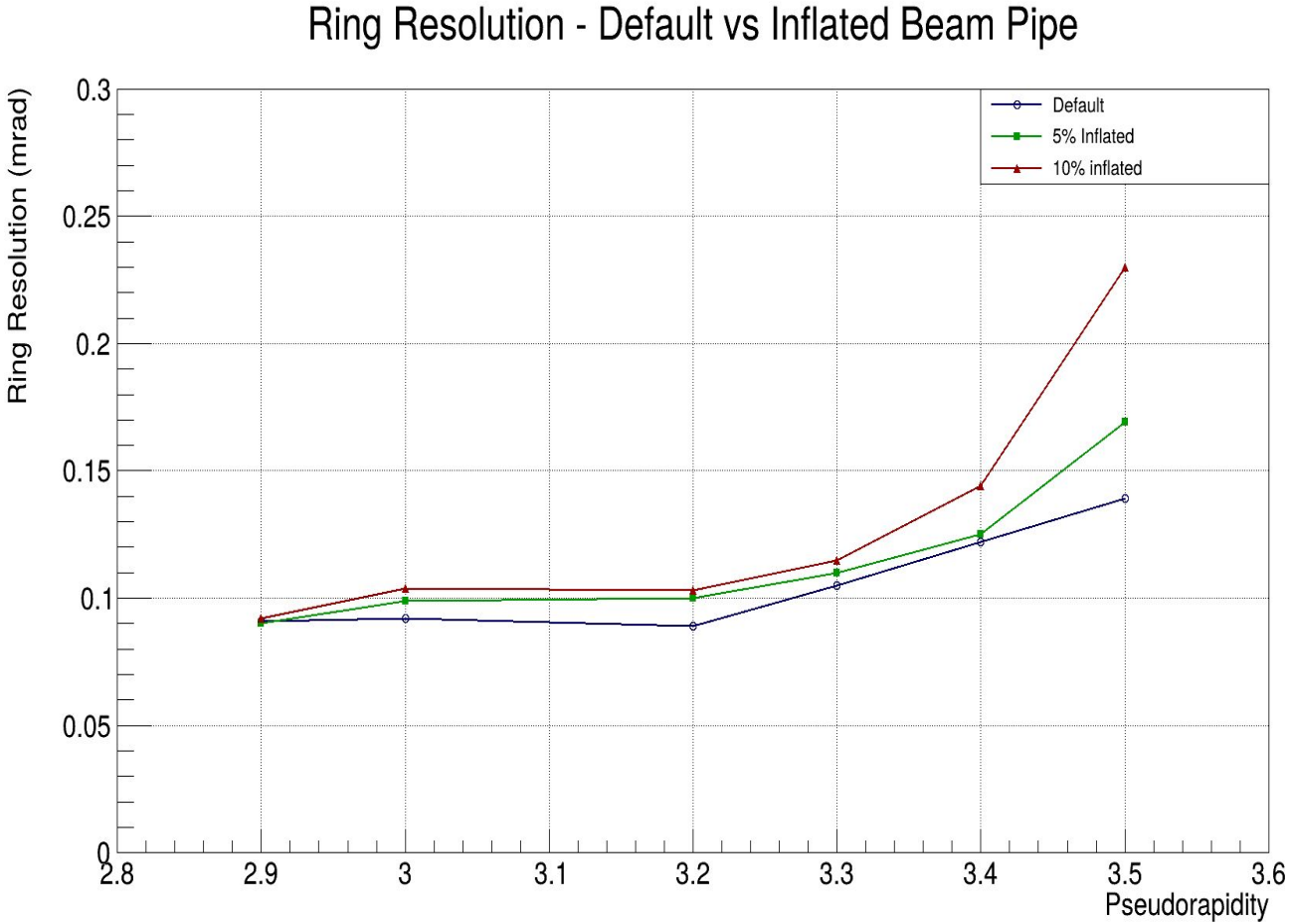
- NPE
- Single photon resolution
- Ring resolution
- N σ separation



- Using poisson fit
- at higher pseudorapidity NPE starts to decrease (As expected)



- using gaussian
- After inflation the resolution decreases as we approach high pseudorapidity



- SPE/sqrt(NPE)
- Resolution gets bad at very high pseudorapidity

To be done for next meeting:

- Calculate N-sigma separation
- For momentum 42 and 50 Gev
- Inflate inner bore radius
- Inflate inner and outer bore radius simultaneously to check detectors performance.

Thank you