



Homework Questions
Fast and lightweight
EIC integrated tracking system
eRD3

Barrel MicroMegs & Forward Triple-GEM

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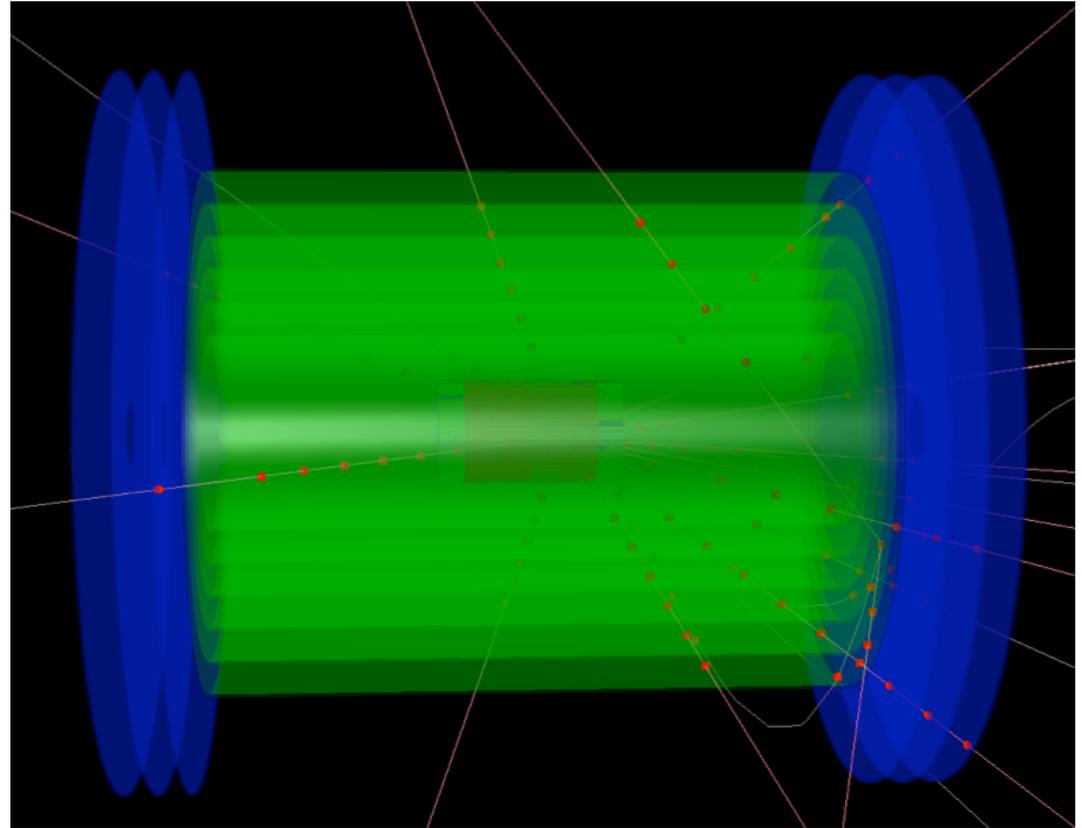
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HW Questions

1. Assuming success of the EIC in the LRP: How do you see your efforts in the next two years?
2. What are your plans towards a transition to a possible collaboration and what role will your R&D group play?





Introduction

□ Overview of eRD3 effort

- R&D effort focuses on **intermediate tracking system**:
 - **Barrel tracking system** based on MicroMegas detectors (Sole MM EIC R&D program) manufactured as cylindrical shell elements and
 - **Rear / Forward tracking system** based on triple-GEM detectors manufactured as planar segments
- R&D effort - **Main strategy**:
 - **Design and assembly** of large **cylindrical MicroMegas detector** elements and **planar triple-GEM detectors**
 - **Test and characterization** of MicroMegas and triple-GEM prototype detectors
 - **Design and test** of **new, common chip readout system** employing CLAS12 'DREAM' chip development, ideally suited for micro-pattern detectors
 - Utilization of **light-weight materials**
 - **Development and commercial fabrication** of various critical detector elements
 - **European/US collaborative effort** on EIC detector development (**CEA Saclay, and Temple University**)

Project Title:

eRD3

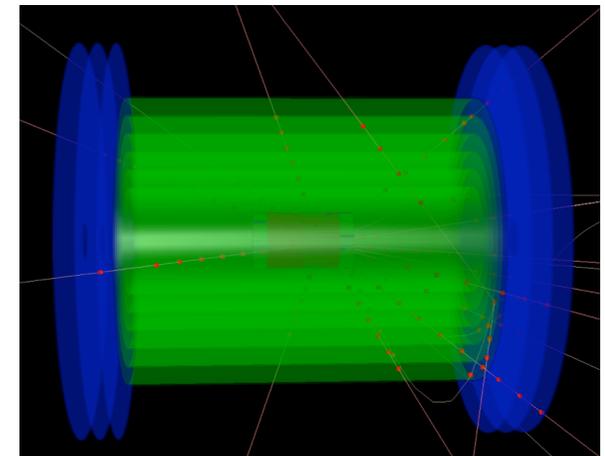
Design and assembly
of
fast and lightweight
barrel and forward tracking prototype systems
for an EIC

Progress report (Q4 FY14 / Q1 FY15)

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Q: How do see your effort over the next 2 years?

□ Answer:

- The **prime focus** between now and FY17, i.e. over the next two years is the **completion of the eRD3 R&D**

program:

- **GEM: Assembly and test of 40 X 40 cm² triple GEM-detectors** using most EIC requirements
- **GEM: New chip readout system** based on MM DREAM system
- **GEM: Fabrication, assembly and test of large, dedicated EIC sector** in collaboration with UVA / FIT
- **MM: Assembly and test of 1D segment**
- **MM: Assembly and test of 2D segment**
- **Simulations: Refined simulations towards micro-pattern EIC tracking system**



Q: Plans for possible collaboration / R&D role?

□ Answer:

- If indeed the LRP is positive towards an EIC facility, the next step will be a **site selection** and **establishing the overall boundaries for an EIC experiment(s)**
- **Formation of an inner tracking R&D group beyond the current eRDi groups**
- Formation of a **real experimental collaboration** proposing a dedicated experiment similar to various collider programs in the past, e.g. RHIC with BRAHMS, PHENIX PHOBOS and STAR
- Formulation of **CDR / TDR towards a dedicated EIC experiment**
- Main focus then: **Micro-pattern tracking system**, specifically GEM / MM system incl. common chip readout system a la DREAM
- Strong interest to participate in a TPC option using Micromegas / GEM technology if such an option would be chosen
- R&D role:
 - **Light-weight materials** through collaboration with CC shop at LBL and commercial vendors
 - **Commercial fabrication of GEM / MM components**
 - **Design, assembly and test of real EIC detector prototype** prior to full production
 - **Chip readout system** based on DREAM chip and AGET chip (dedicated TPC chip)
- Saclay and Temple University are committed to play leading roles in this effort profiting from their R&D experience and local infrastructure