Forward detectors at the LHeC

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LHeC conveners meeting

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Considering forward detectors at the LHeC...

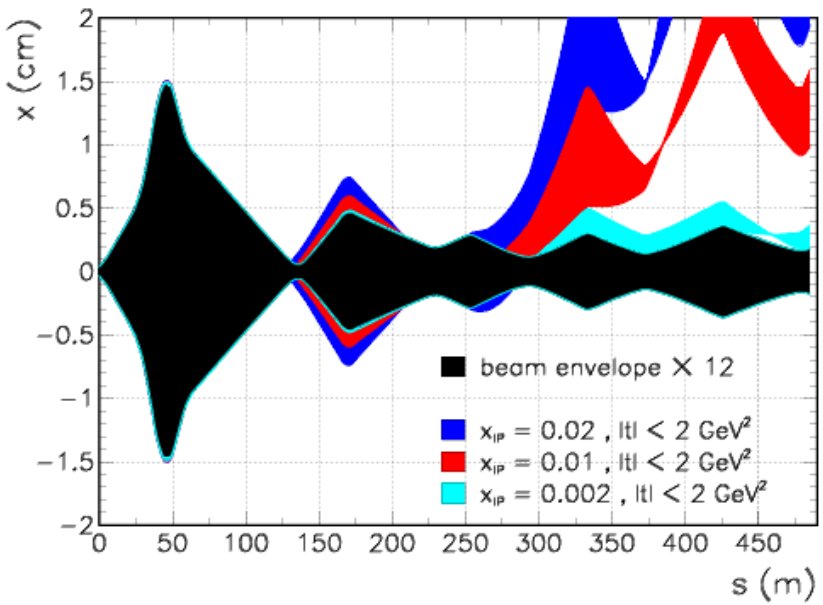
Items to study for CDR:

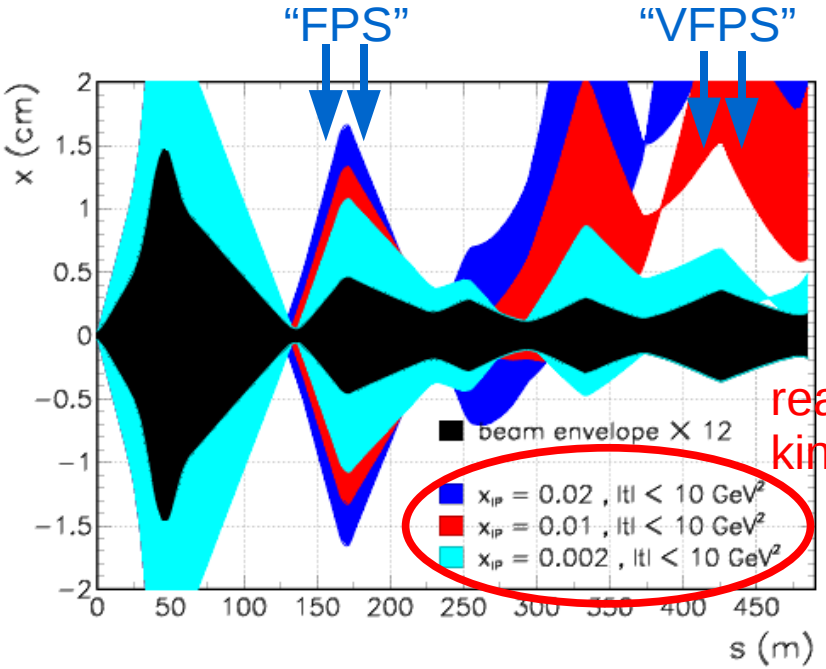
- Forward tagging of proton, deuterons, neutrons, ...
- Acceptances at various locations
- Reconstruction of kinematics and resolution limits from beam
- Calibration
- Mechanism to approach beam
- Detector types

Next slides:

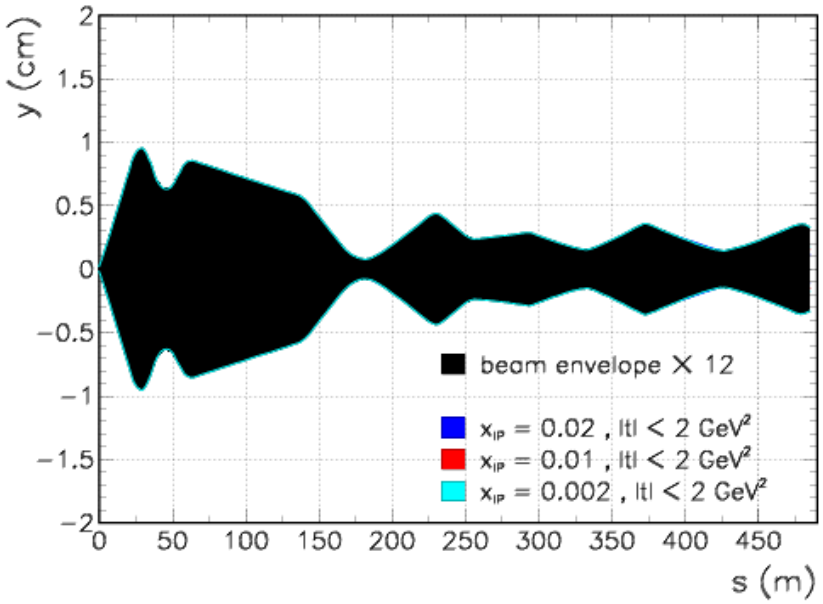
- A preliminary view on forward proton tagging and LheC beam optics (only RR dating from June 2008 © B. Holzer)
- To be cross checked with up-to-date trajectory simulation!

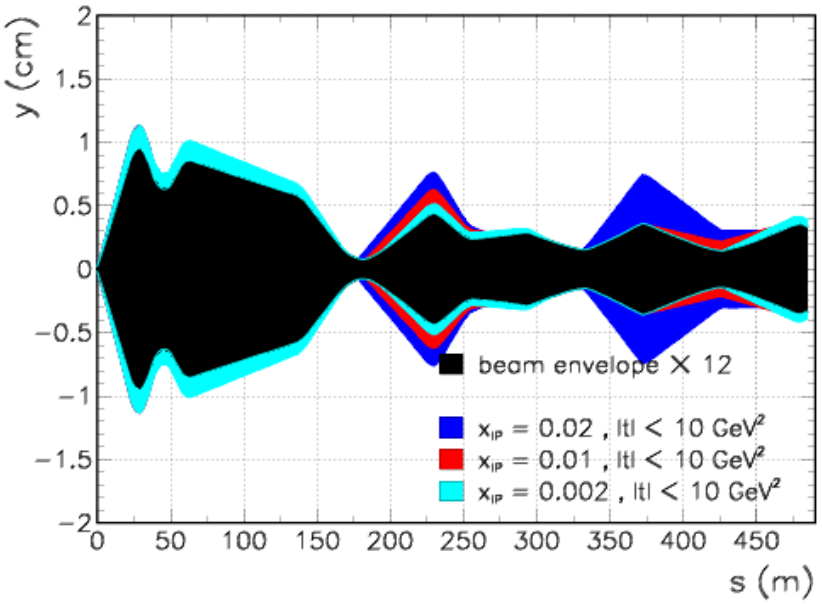
Proton trajectories



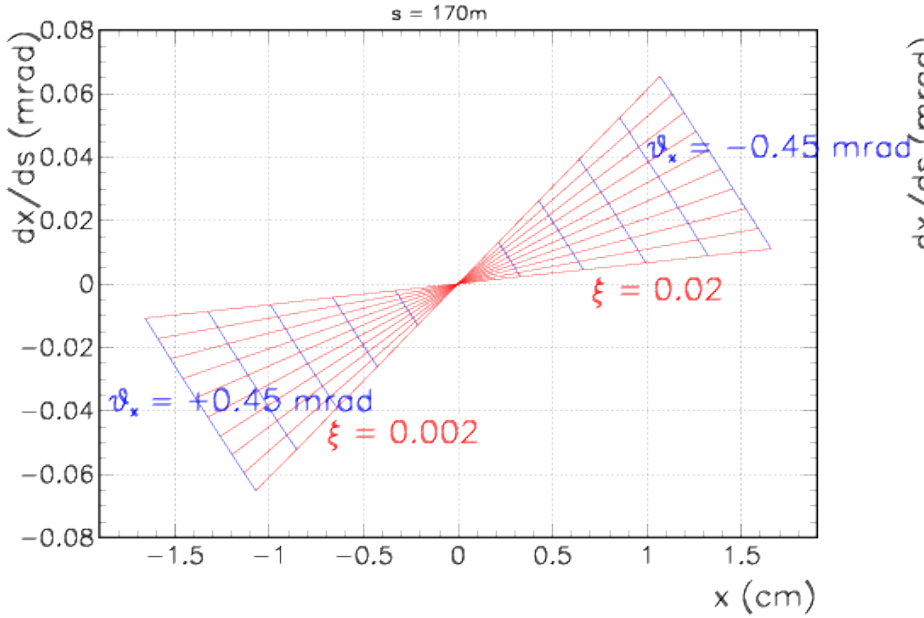


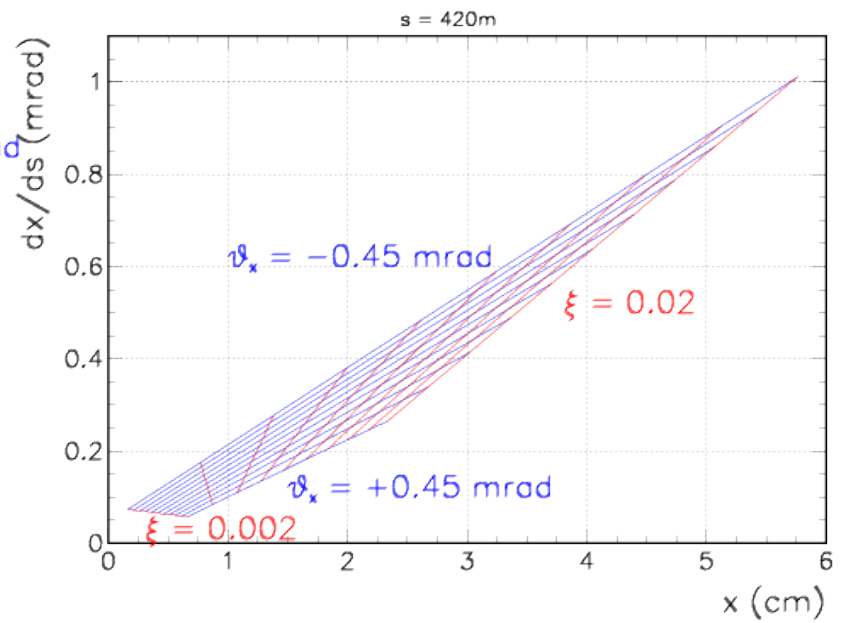
reasonable kinematics?

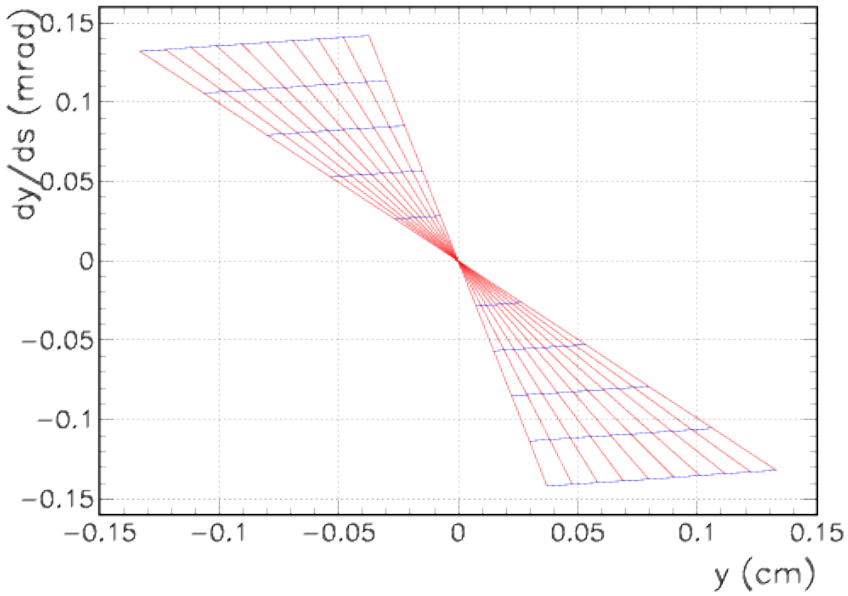


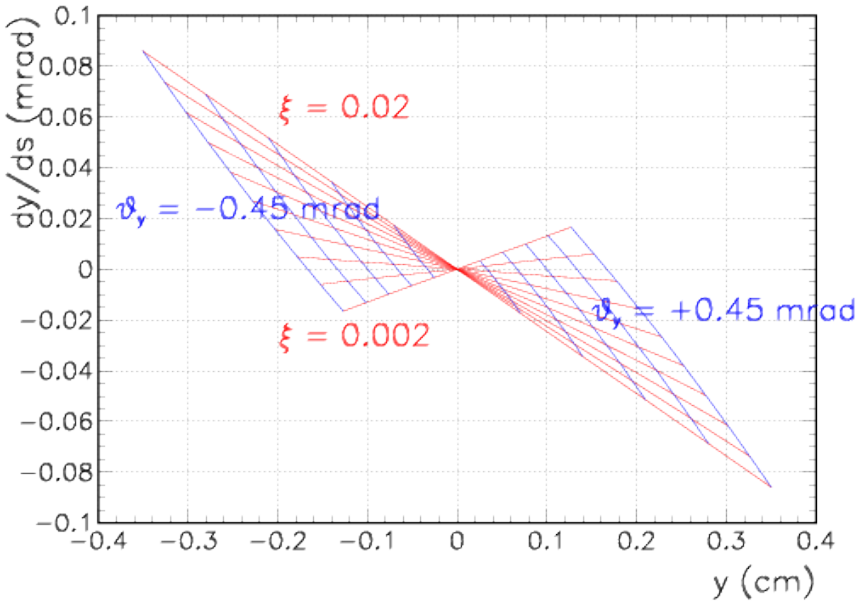


Proton position & slope vs. kinematics

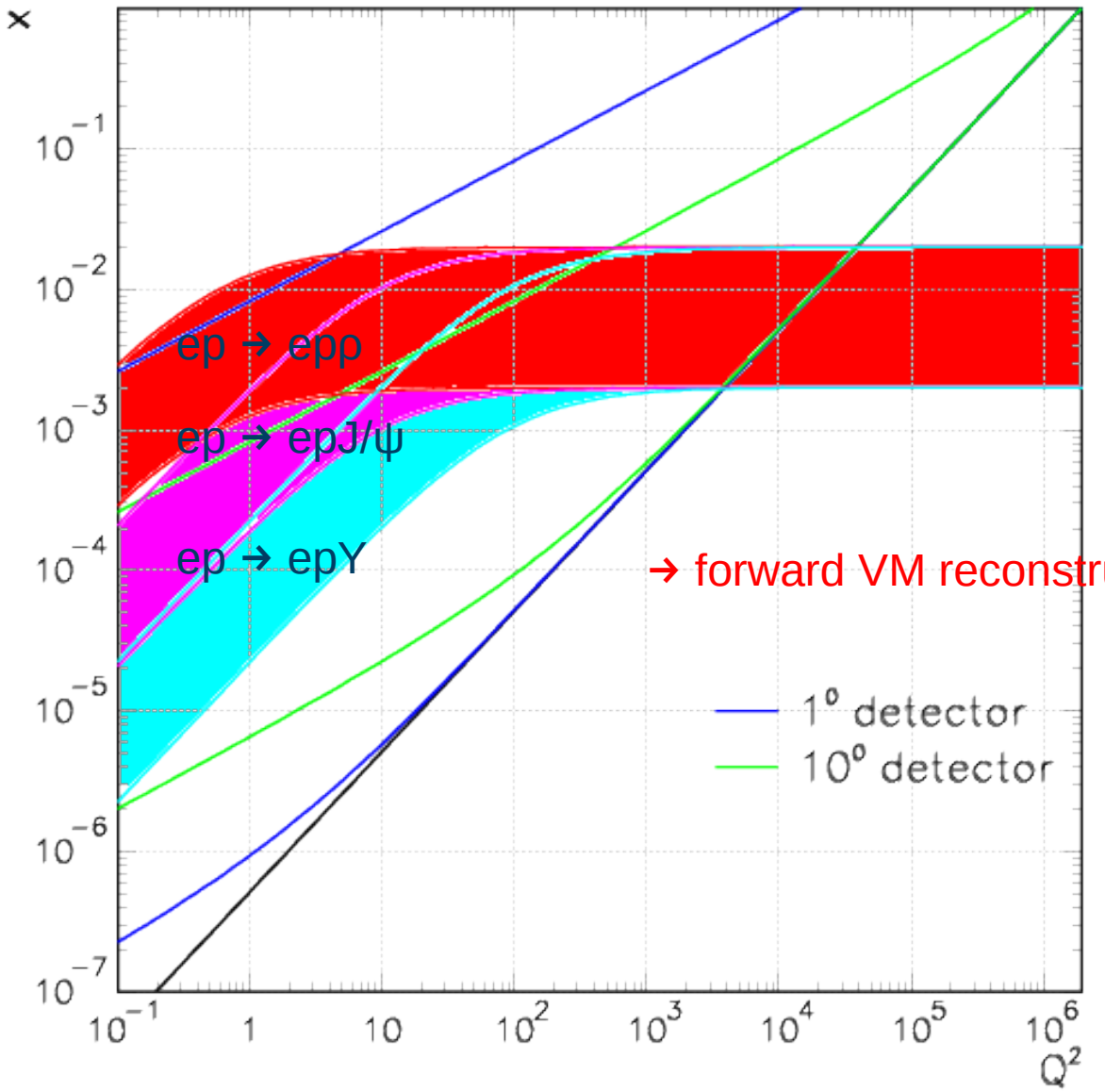








Calibration with elastic VM production



What can be contributed to the CDR?

Forward proton/deuteron spectrometer

- Calculations based on LheC optics (P. Van Mechelen, P. Taels)
  - Proton (deuteron) trajectories
  - Acceptance plots for different locations
  - Resolution studies on x_{IP}, t, ...
- Forward/central VM reconstruction (?)
- Detector options (A. De Roeck)
  - Using FP420 experience...

Forward neutron calorimeter (A. Bunyatyan?)

Backup slides

HECTOR

A program to compute particle trajectories in generic beam lines:

- X. Rouby et al 2007 JINST 2 P09005
- http://www.fynu.ucl.ac.be/hector.html
- Used in CMS for study of High Precision Spectrometers
- Input: MAD “TFS” optic files