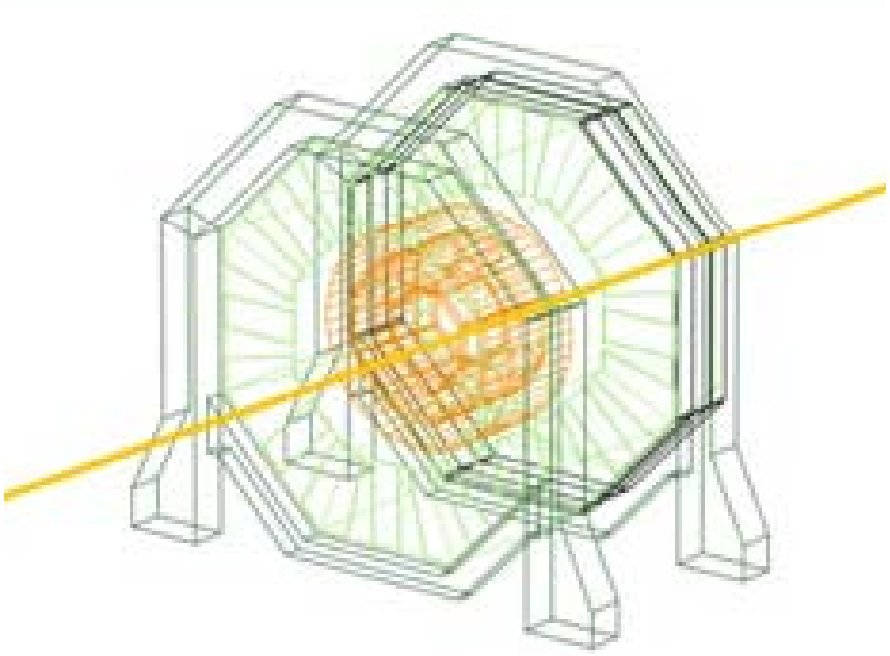
LOI
Vertex and Tracking



Marcel Demarteau

Tracking Meeting
December 5, 2008

LOI Status

- Very, very rough draft of vertex and tracking contribution submitted to LOI editors
- Not distributed to the group because it was in too rough a shape
- The notion of submitting a 5-10 page write-up for the vertex/tracking system, which was unrealistic to start with, has completely evaporated since LCWS08
- From the LOI editors (Nov. 26):
  - "Subsystems to provide reasonably polished detailed reports, following the template provided at the Boulder meeting, BY DECEMBER 15. These reports should be as long and detailed as you feel necessary to address the issues raised by the IDAG for the 'validation' process"
  - "The reports can/will be added as appendices to the LoI. The IDAG has indicated that they *will* read these reports! The editors will be responsible for condensing the detailed reports into sections of length that meet the overall LoI requirement of c. 100 pages."

- Reinforces the notion that we should aim for a publication.
- If the group agrees, would like to tell the editors that we will not meet the December 15 deadline
- Hopefully we can get the writing assignments in by Dec. 15

Outline and Assignments

• Introduction	Marcel
• Beam Environment	Takashi
• Mechanical Design Vertex Detector with beampipe	Bill / Kurt / Sudong / Ron
• “ladder” design and cabling	Bill / Kurt / Sudong / Ron
• Mechanical Design Tracker	Bill / Kurt / Tim / Rich / Marcel
• Sensor design	Tim
• Sensor test results	Sally / Martin / Tim / …
• Module design	Tim / Bill
• Readout Vertex Detector	Sudong / Ron
• Readout Tracker: kPix and cable	Tim / Martin
• Overall power distribution and DAQ	Günther ?
• Summary: material budget / coverage / readout channels	Marcel
• Simulation	
– Framework	Norman
– CCD simulation and digitization	Nick
– Strip simulation and digitization	Tim
– Planar Segmentation	Jeremy / Tim
– Virtual Segmentation	Dima
• Track reconstruction	
– Vertex	Nick
– Tracker and overall	Rich
– Calorimeter Assisted	Dima
– Track Fitting	Nick / Rob / Bruce

Outline and Assignments

- Stand-alone performance
  - Vertex detector — Nick
  - Tracker — Rich
- Overall performance
  - Whole tracking system — Rich / Nick / Dima / Rob / …
  - b-tagging — Andrei / Tim
- Calorimeter Assisted Performance — Dima
- Performance for different beam conditions — Rich
- Performance in physics benchmarks — Tim / Andrei
- Alignment
  - Interferometry — Keith
  - Sensor Transparency — Alberto

- Proposal: over the next few days I will send the lead person for each bullet a start LaTex file to be edited and updated.

R&D

• Vertex Sensor Technology	All
• Support structures	Bill / Kurt
• kPix	Tim
• Cable design	Martin / Sally
• Time-over-Threshold	Bruce
• Charge division	Rich
• Thin silicon	?
• Power and Lorentz forces	Bill / Sudong / ?
• Beam tests of sensors etc.	all

IDAG Questions

- Sensitivity of different detector components to machine background as characterized in the MDI panel
  - Addressed through different vertex sensor detector technologies
- Calibration and alignment schemes
  - University of Michigan system and Spanish system
- Status of an engineering model describing the support structures and the dead zones in the detector simulation
  - Described in the main text
- Plans for getting the necessary R&D results to transform the design concept into a well-defined detector proposal
  - Will be addressed in the description about sensor technologies and R&D
- Push-pull ability with respect to technical aspects
  - Defer to overall write-up on push-pull
- A short statement about the energy coverage, identifying the deterioration of the performances when going to energies higher than 500 GeV and the considered possible detector upgrades.
  - Background plot will include 1 TeV running
- How was the detector optimized: for example the identification of the major parameters which drive the total detector cost and its sensitivity to variations of these parameters
  - No optimization done as of yet