

Outline for Gaseous Detector R&D Report

Instrumentation Frontier
Gaseous Detector Subpanel

Scope of Detectors

- ▶ Wire chamber
 - MWPC
 - Drift Chamber
 - Straw Tube
 - Gas TPC
- ▶ Micro–Pattern Gas Detectors
 - GEMs
 - Micromegas
- ▶ Resistive Plate Chambers
- ▶ Thin Gap Chambers

Applications

- ▶ Charged particle tracking
 - Momentum measurement
 - Vertexing
- ▶ Calorimetry
 - Fine grained sampling
 - Particle flow algorithms
- ▶ Muon detection & tracking



Technical Requirements/Limitations

- ▶ Wire chambers
 - Rate limited
 - Wire aging in high fluence environments
 - Detector mass
 - Compactness
- ▶ Micro–Pattern Gas Detectors
 - Low Cost Construction
 - Radiation damage tolerance
- ▶ RPC
 - Need improved high rate capability



Key R&D Directions

- ▶ Wire Chamber
 - Low mass fabrication
- ▶ MPGD
 - Cost reduction
 - Efficiency/dead area
 - Large scale construction techniques
- ▶ RPC
 - Lower resistant plates



Outline for Gaseous Detector Summary Report “Whitepaper”

- ▶ Introduction
 - Very brief history
 - Physics justification
 - Current uses
 - Future direction
- ▶ Applications in the Energy Frontier
 - Physics capability
 - Limitations specific colliders
- ▶ Applications in the Intensity Frontier
 - Physics capability
 - Limitations for high rate environments
- ▶ R&D Needs of Specific Technologies
- ▶ Opportunity/Prospect for U.S. Leadership
 - Wire chambers –

