

# Electron Detector Locations and Beam Pipe Solenoids

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## Outline

- Detector Hardware Design and Implementation
- Locations for ED
- Beam Pipe Solenoids

# Electron Detector Hardware

## Scope:

Install a few (~ 12) modular units at potential locations

Use maximum size port (& electrodes) available (~12cm ID, 75cm<sup>2</sup>, ~70°)

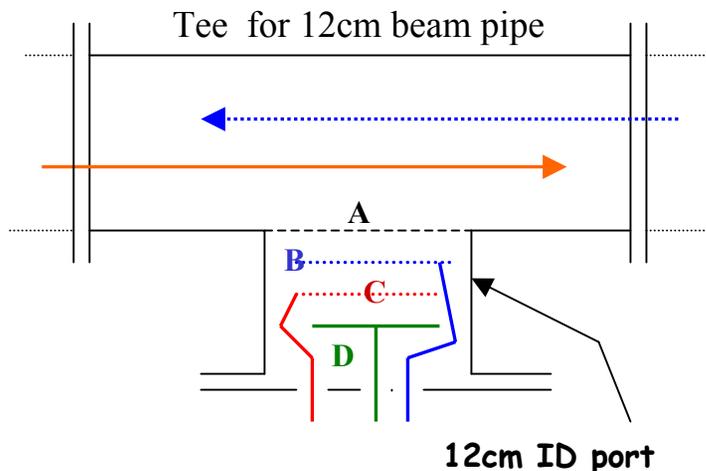
Shall have no impact to the beams (well shielded)

Reasonable cost and fit into shut down work load and schedule

How: Modify & replace 12cm ID beam pipe w/  
commercially available 12cm ID x 25cm L tee

Have vendor fabricate the detector hardware

Both orders placed already



## Detector Configuration:

**A:** RF shield w/ < 3/16" holes and ~ 20% transparency

**B:** retarding electrode (< - 1kV) & > 80% transparency

**C:** anode grid (< 1 kV) & > 80% transparency

**D:** electron collector plate (~ 4" diameter)



## Solenoid Winding Plan

Select a few locations near ED to wind coils on the 12cm beam pipes

To confine the electrons in a small spiral orbit of ~ cm radius

Most electrons  $E_0 \sim eV$ , accelerated by beam to  $10^2 eV$ , SEY peaked  $\sim 300 eV$

#10 building wire  $\Rightarrow \sim 4,000$  A.turns/m  $\Rightarrow \sim 50$  Gauss  $\Rightarrow \sim 130$  W/m (T?), 7 V/m

#10 magnet wire  $\Rightarrow < 80$  Gauss (T??); multi-layer (Cooling?); #8 wire?

Spiral radii vs. electron energy and B

