

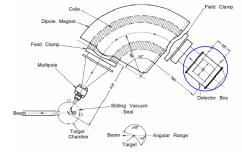
## MDM FOCAL PLANE OXFORD

# DETECTOR Mohamined Tunaid Parooqi

Texas A&M Cyclotron Institute

**REU Summer 2005** Advisor: Dr. Tribble





### THE DETECTION PRINCIPLES

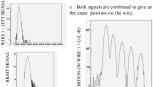
## The Detector consists of an ionization chamber to measure AE for particle identification and a scintillator to measure The Detector consists of four 16 in long Resistive wire proportional counter separated by 16 cm to measure x position and θ. residual E and provide a trigger.

#### POSITION DETERMINATION

PARTICLE IDENTIFICATION

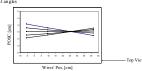
The signal is detected from both ends of

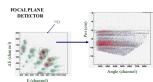
POSITION DETERMINATION



## POSITION DETECTION AND FOCAL PLANE

- The signals from the Resistive wires are recorded.
   The Positions can be used to trace their path through the chamber.
   Seams enter the detector.
- o They are only 5 beams because of the 5 finger mask right after the target





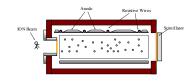
- o The focal plane is where the particle is
- o  $\ U$  sing the picture in the focal plane we can find the different energy levels of the particle.

#### o The ionized particles in the gas hit the $\Delta E$ plates and the some hit the

- The softeep partices in the gas in the Δr. paters and the some in the Resistive wers.

   The anodes detect the number of electronshitting the plate and the Resistive wires detect the electron that hit them.

   The charge created by the hitting electrons can be used to measure the ΔE.



### PARTICLE IDENTIFICATION

- o ION dude runs into the scintillator
- o The energy of the particles causes the scintillator to be activated.
- Energized electrons try to stabilize and in the process create photons.
- o These photons are directed into the Photo-Multiplier tubes were they become usable photo electrons creating a signal.



PHOTO-MULTIPLIER LEFT



After the  $\Delta E$  and the residual energy signals are put together we see how much energy the ion lost and then use that information to identify the particle.

\*\*DATA in this presentation was acquired from the experiment done by the RET group earlier.

### MODIFICATION AND REPAIR



- We build a clean room
- entrance.
  o Cleaned the room
  o Changed the air filters in
- Installed new lights to make



- connected to the Kapton window

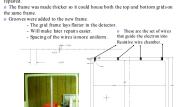
- o The area between the scintillator and Kapton was filled with air.
  o Now because of the added new O-Ring groove the scintillator will be connected
- to the Kapton window.

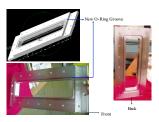
  o The area between will be a vacuum



- FRISCH GRID

  Another Frame had to be designed because the old Frisch grid could not be





- O Weights were made in the machine shop.
  The right tension was applied on the wires using these weights.
  Wires were hid in the grooves.
  Solder and 5 minute Epoxy glue was used to hold them in place



- o These fine copper wires can stand tension of about 3 lb before they break o These wires were also damaged
- during the Tragedy. They had to be rewired and solder
- them back on Total number of wires on the Frisch
  - 337 on the main side - 4 sets of 14 on the side for
  - Resistive wires
     14 in the front and back-







