Fermilab

Microwave Schottky Pickups at Fermilab

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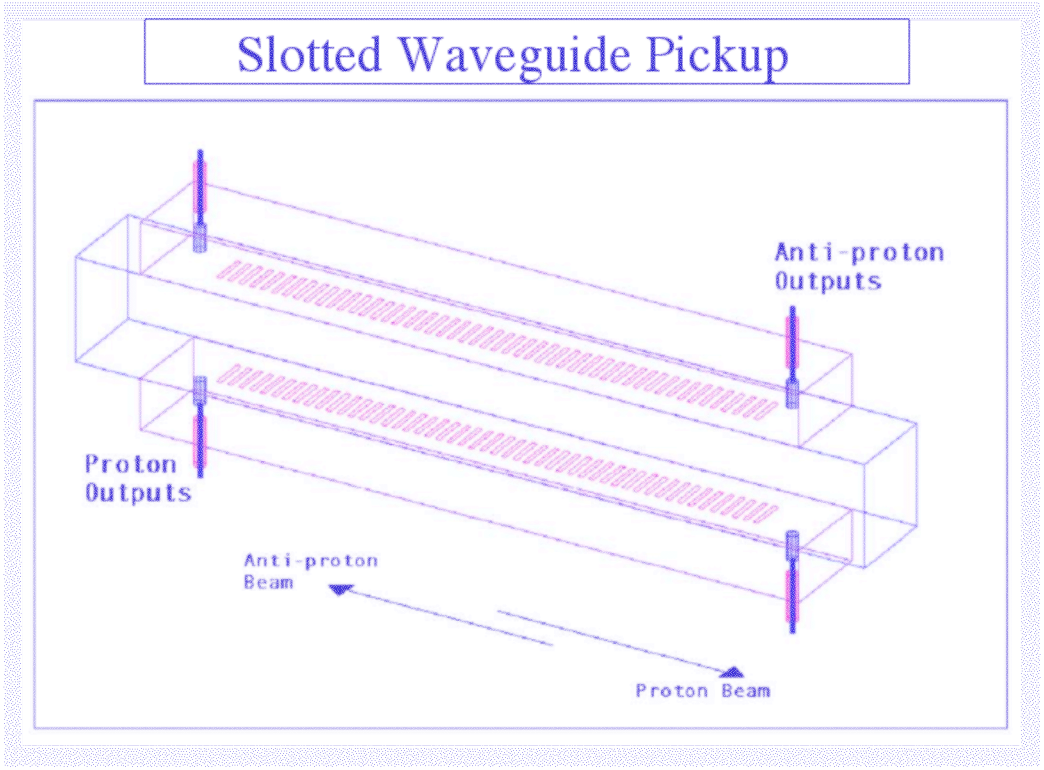
- ***Microwave Schottky Pickups at Fermilab***
  - *Pickup Design*
    - *Mechanical*
    - *Electrical*
  - *Recycler*
    - *System Response*
    - *Performance*
  - *Tevatron*
    - *Common Mode*
    - *Signal Processing*
    - *Performance*

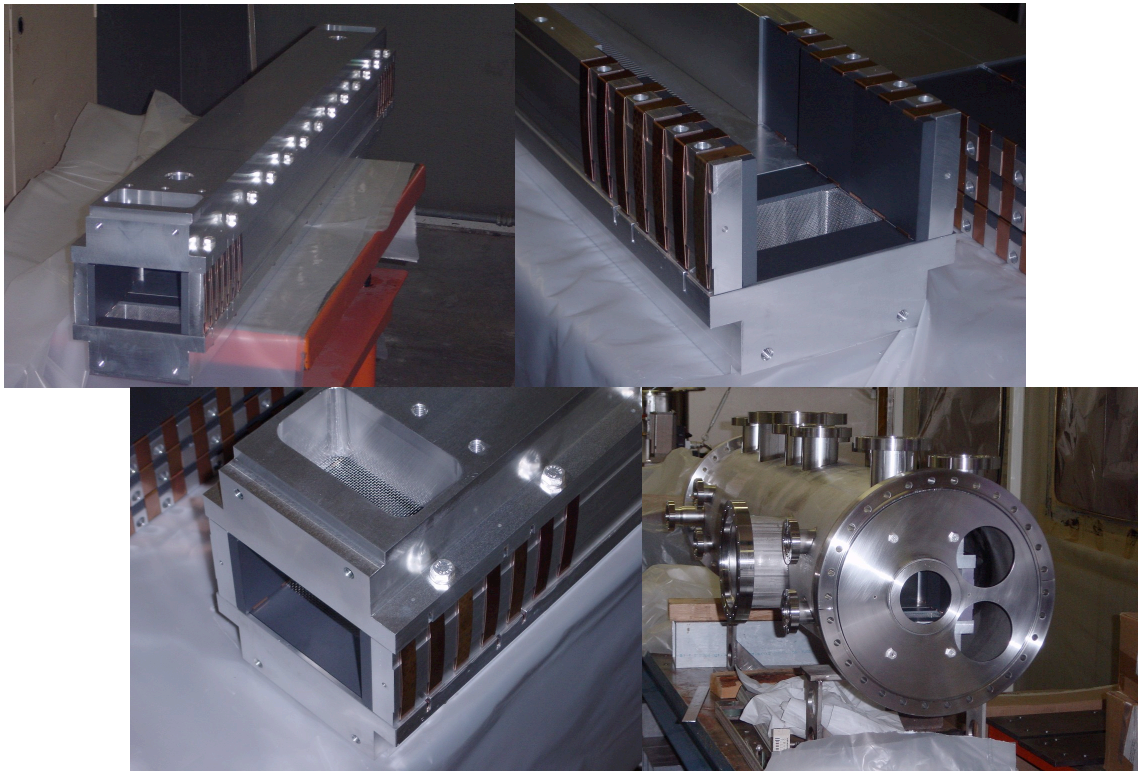
Microwave Schottky Pickups



1.7 GHz 109 x 75 mm aperture

Microwave Schottky Pickups

Array Assembly



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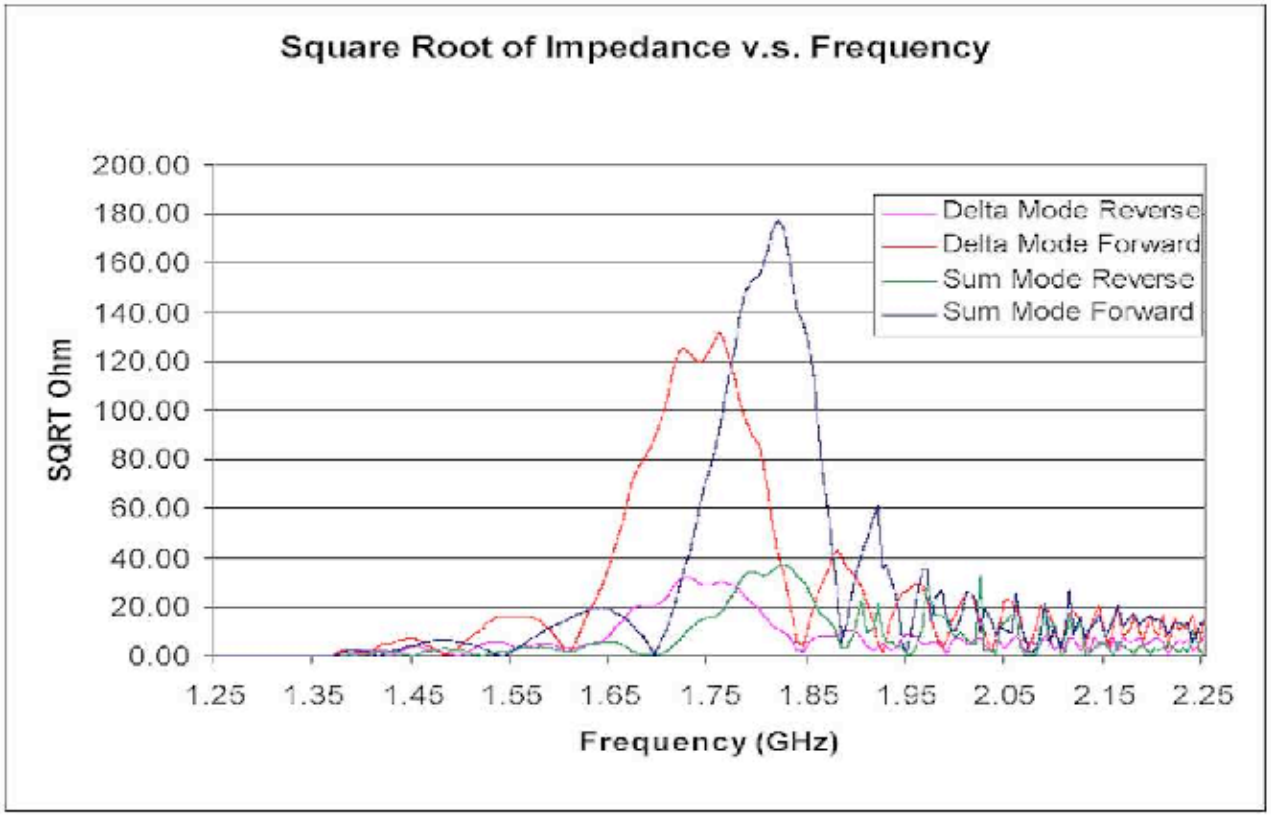
Schottky Pickup Frequency Response



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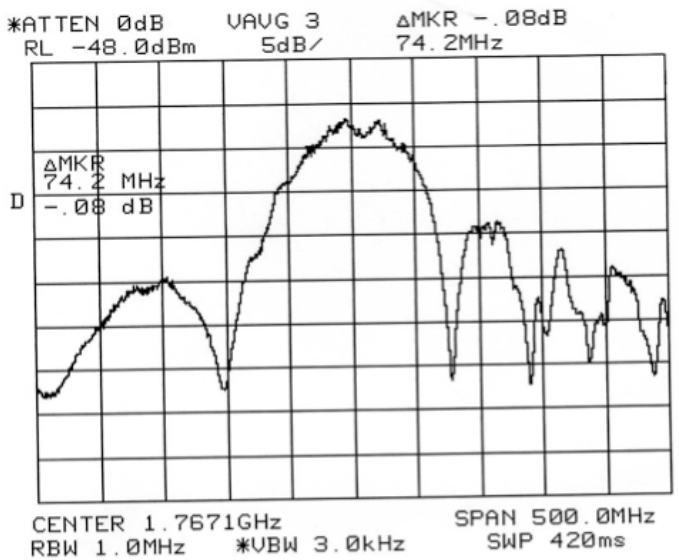
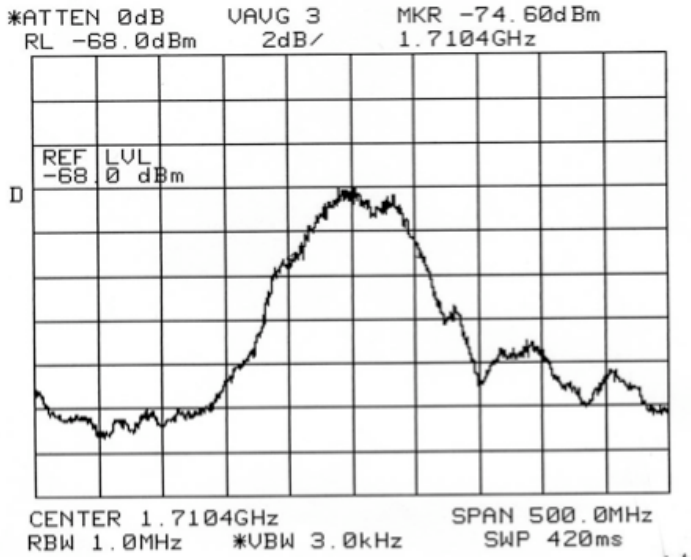
Measured Pickup Sensitivity in Recycler



Sum Mode



Difference Mode

Directivity Measured at 12-15 dB

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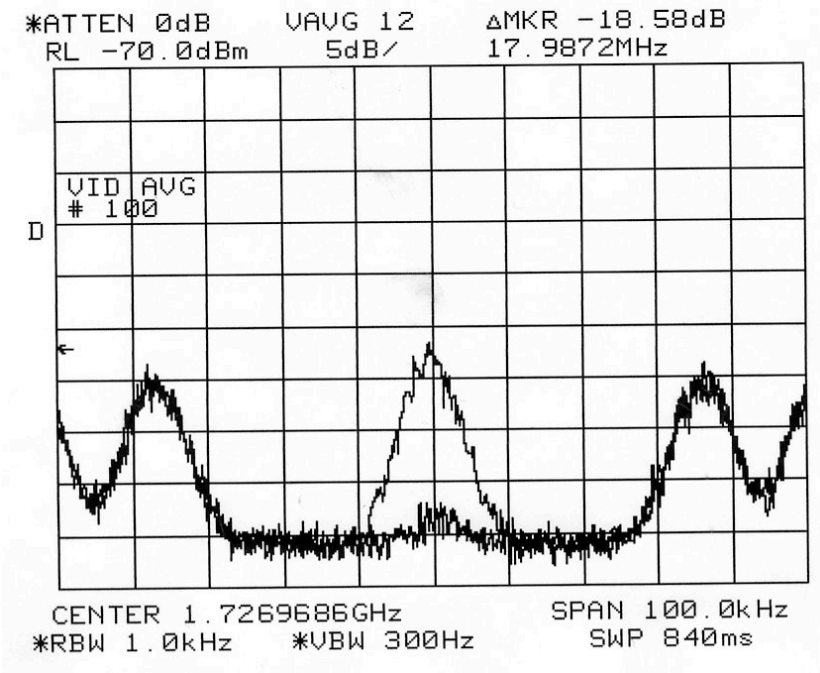
Beam Centering Reduces Common Mode



Recycler Horizontal Pickup 1 x 10^{11} Protons

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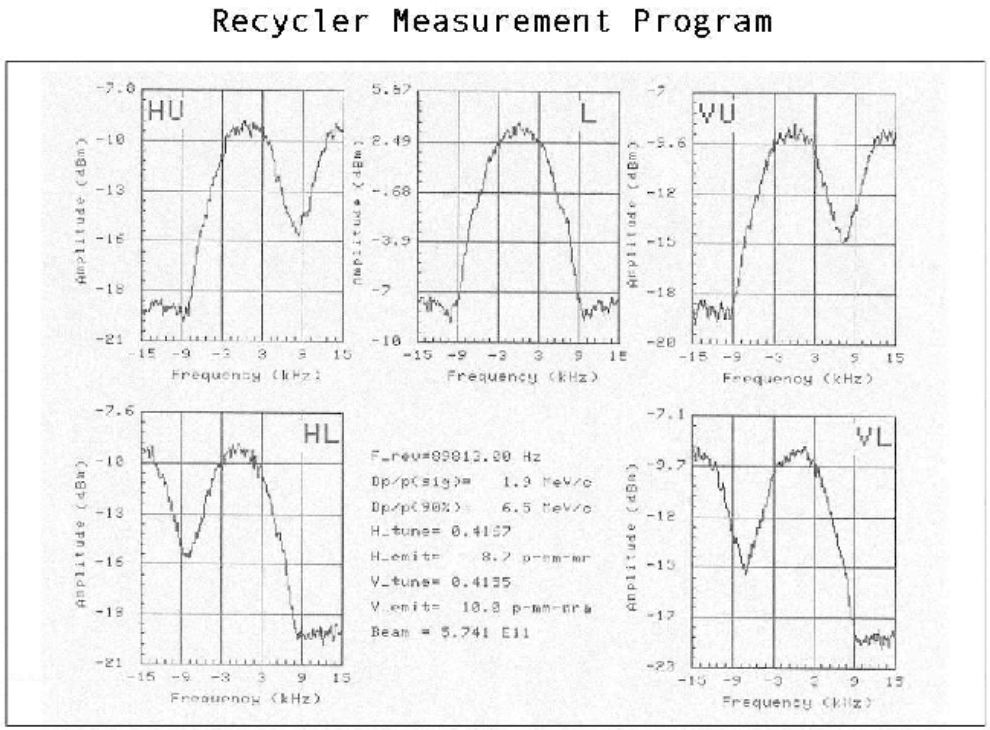
Recycler Automated Vector Signal Analyzer Program



Provides momentum spread, tune, revolution frequency, calculated emittance.

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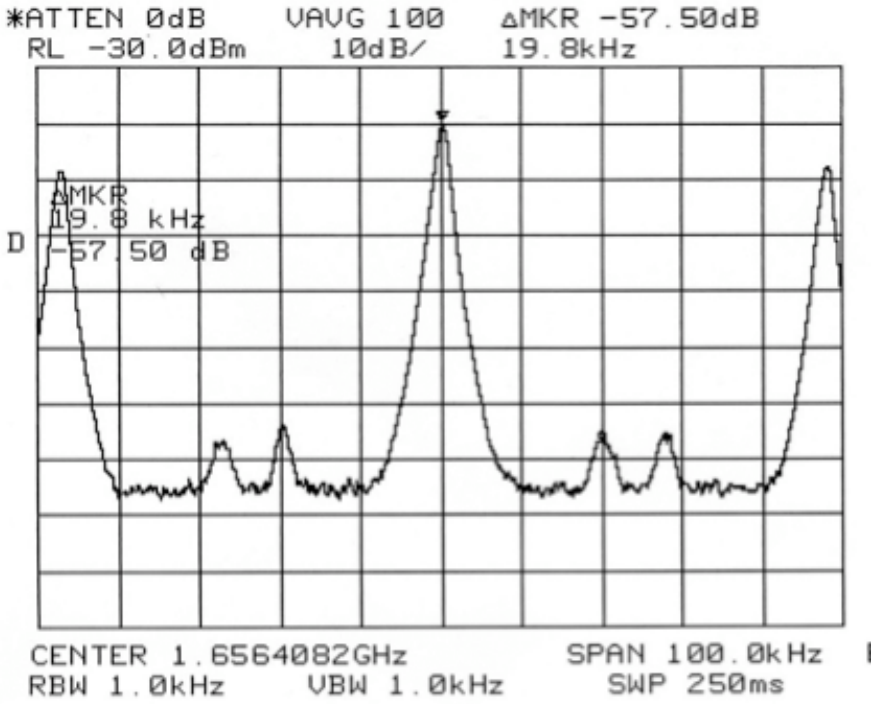
Tevatron Schottky Signal
Large Common Mode Signal Requires High Dynamic Range



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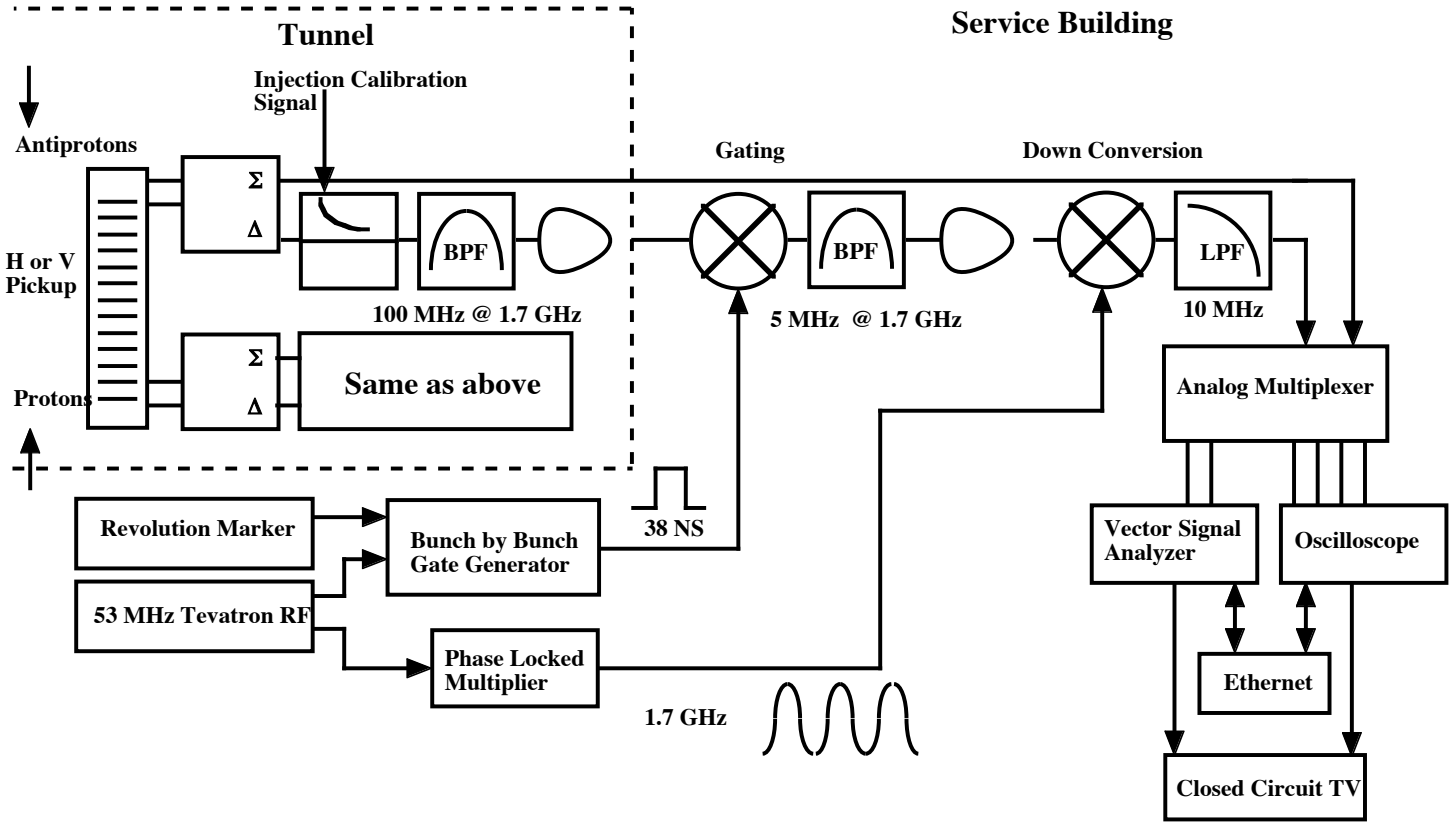
Tevatron Schottky Signal Processing



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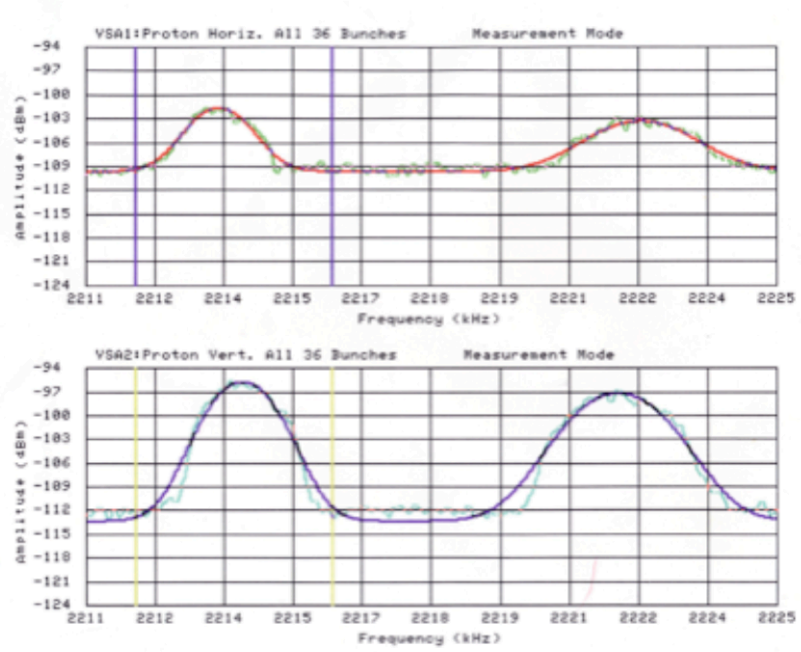
Tevatron Proton Schottky Signals



Horizontal

Vertical

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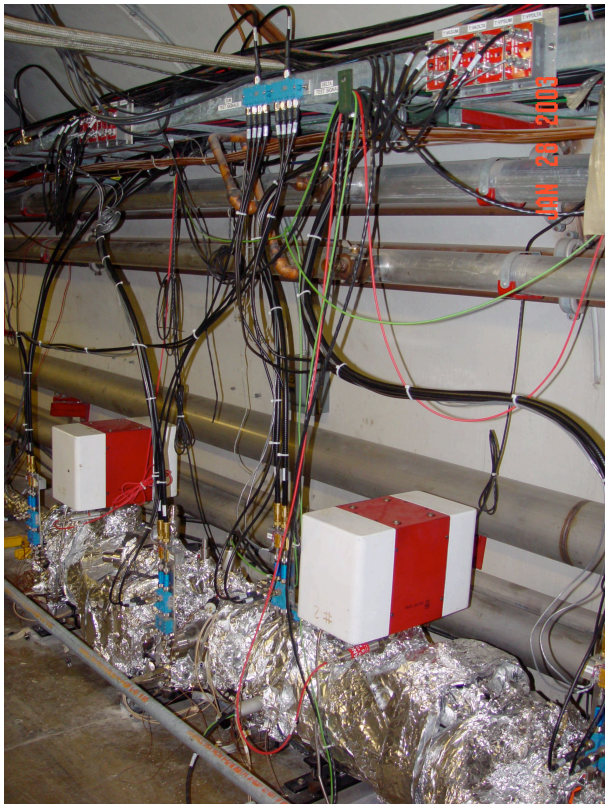
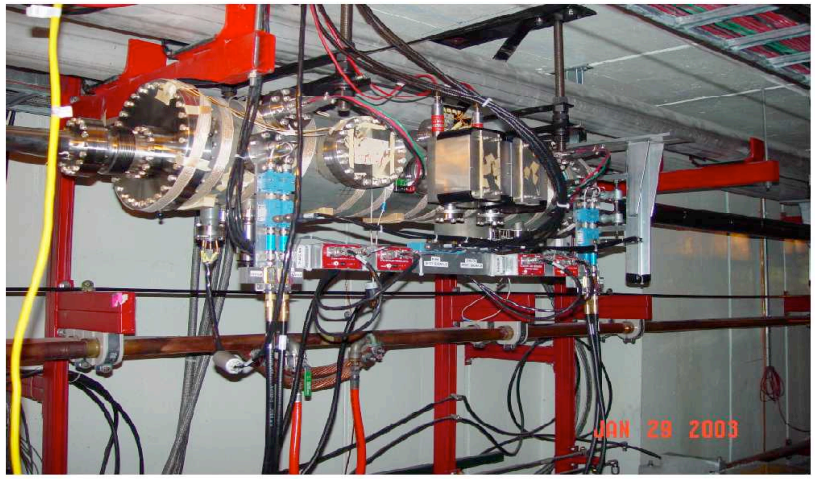
Tevatron Installation





Recycler Installation