



External contribution from Italy and Russia

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CERN, July 8th 2005

Overview



- \ Crystals
- \ Goniometers
- \ Simulations (see Fedotov work on web page)
- \ External detector
- \ Roman pots detectors
- \ Readout and acquisition
- \ Installation
- \ Preliminary set-up test in 2006

New Crystals

PNPI and Ferrara Team

When bent crystal should be installed in a collider ring, small size 's' crystals are preferable.

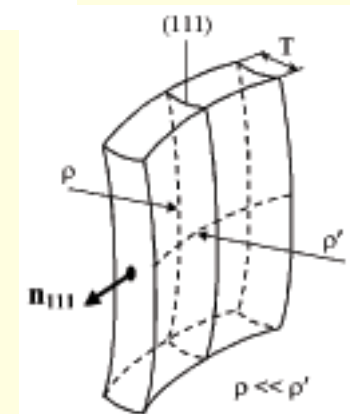
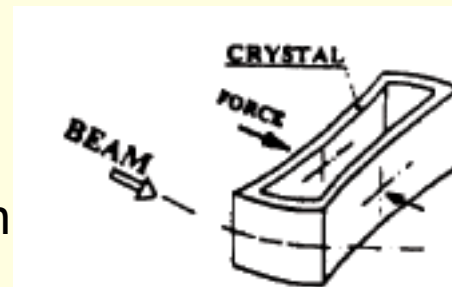
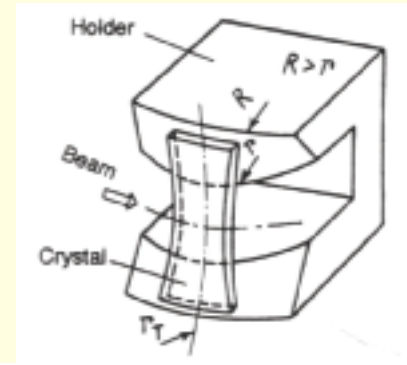
Three types of short bent crystals to channel high energy protons are developed:

- Strip crystals
- O-shaped crystals
- Elastic quasimosaicity crystals

Etching of the surface plays significant role in eliminating portion of the crystal lattice that has significant crystalline disorder and in relaxing superficial strains.

Crystal can be characterized before installation :

X-rays, electrons, low energy protons and alpha particles at LNL, and high energy protons i.e. at IHEP

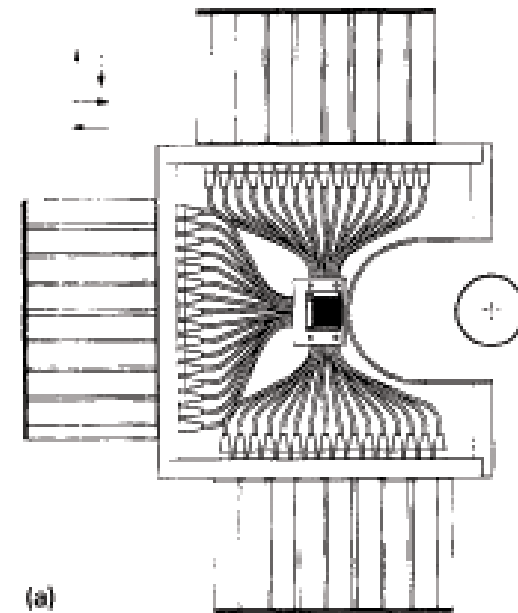
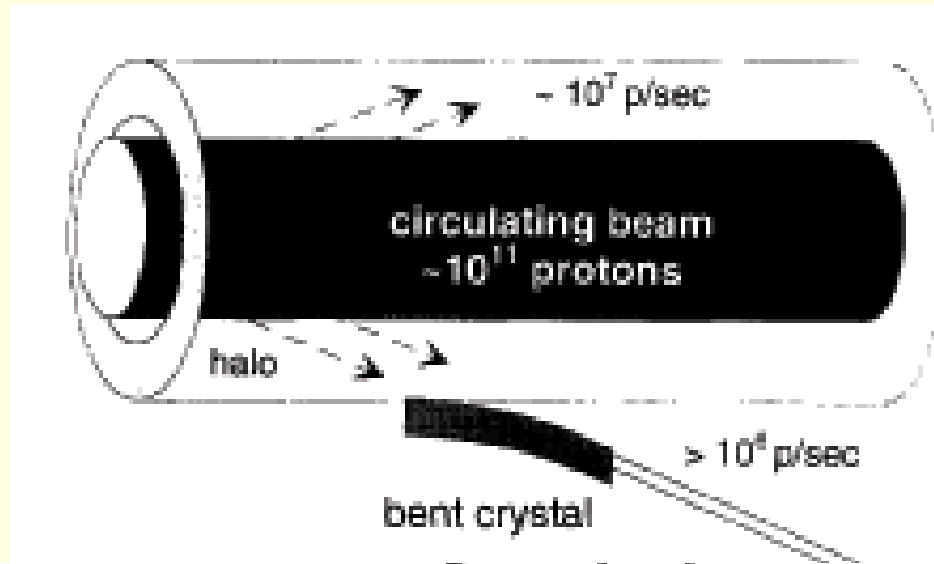


Goniometers

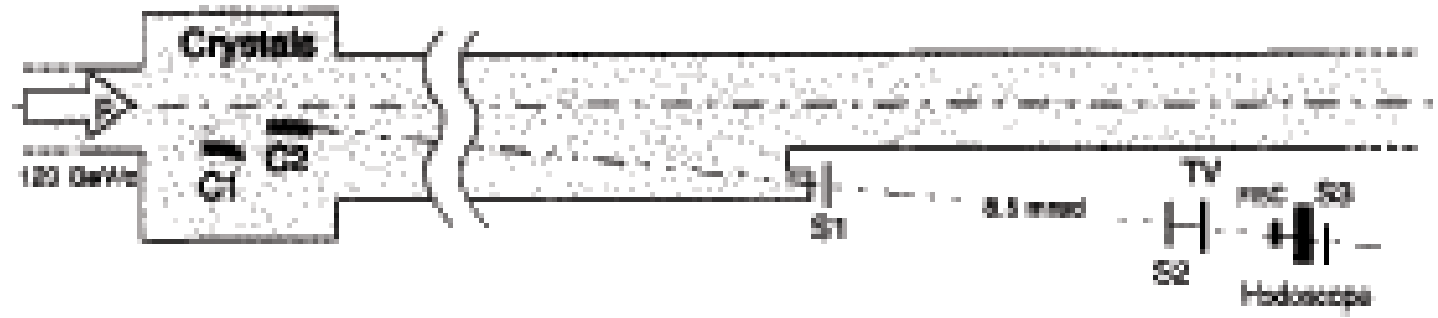


Two precision goniometers used by RD22 have been found. The Legnaro group will take care of the control systems and compatibility with new crystals set/up.

External detector



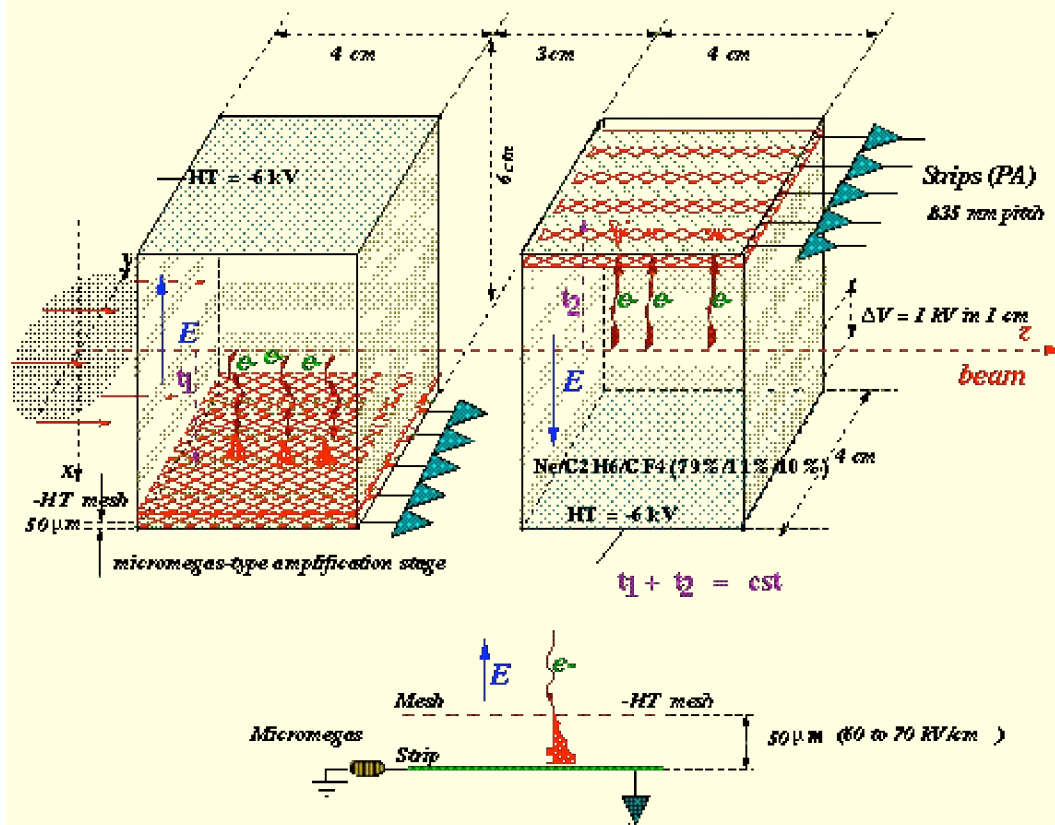
H
O
D
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E



External detector



Micromegas Time Projection Chambers



MICROMEGA gas chamber stations
measure beam particle

- charge (prob. mis-ID $\sim 10^{-2}$);
- momentum ($\delta p/p = 0.7\%$);
- position in the 2nd achromat ($\delta x, y \approx 100 \mu\text{m}$).
- Time 700 ps

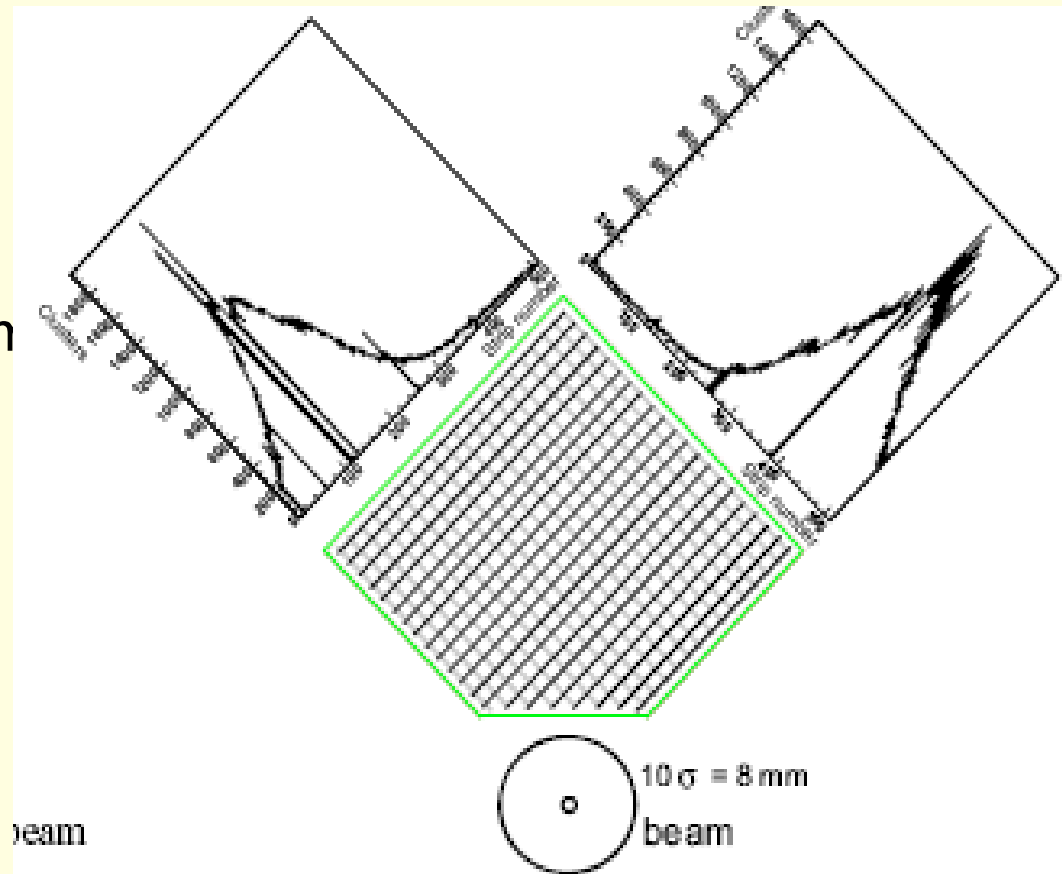
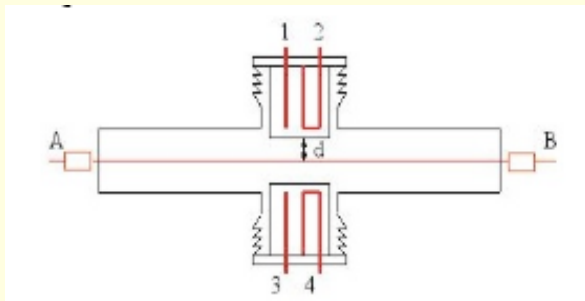
Measurement of kaon beam
momentum in NA48:

Working at 20 MHz

Totem Roman Pots



2 vertical Roman Pots
installed in SS5 in 2004
8 Silicon strip detectors
with 66 μm pitch.
Retracted position: 40mm
Approach the beam
Center 10σ (8 mm)



Totem test readout : Analog APV25 chips and

2 digital VFAT chips used for triggering DAQ in coincidence with the sum signal of 4 pick-up electrodes of a beam position monitor.