



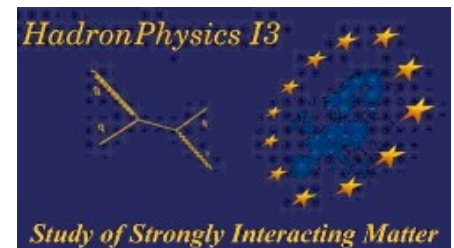
R & D for RPC
News from ELBE



Forschungszentrum
Dresden Rossendorf

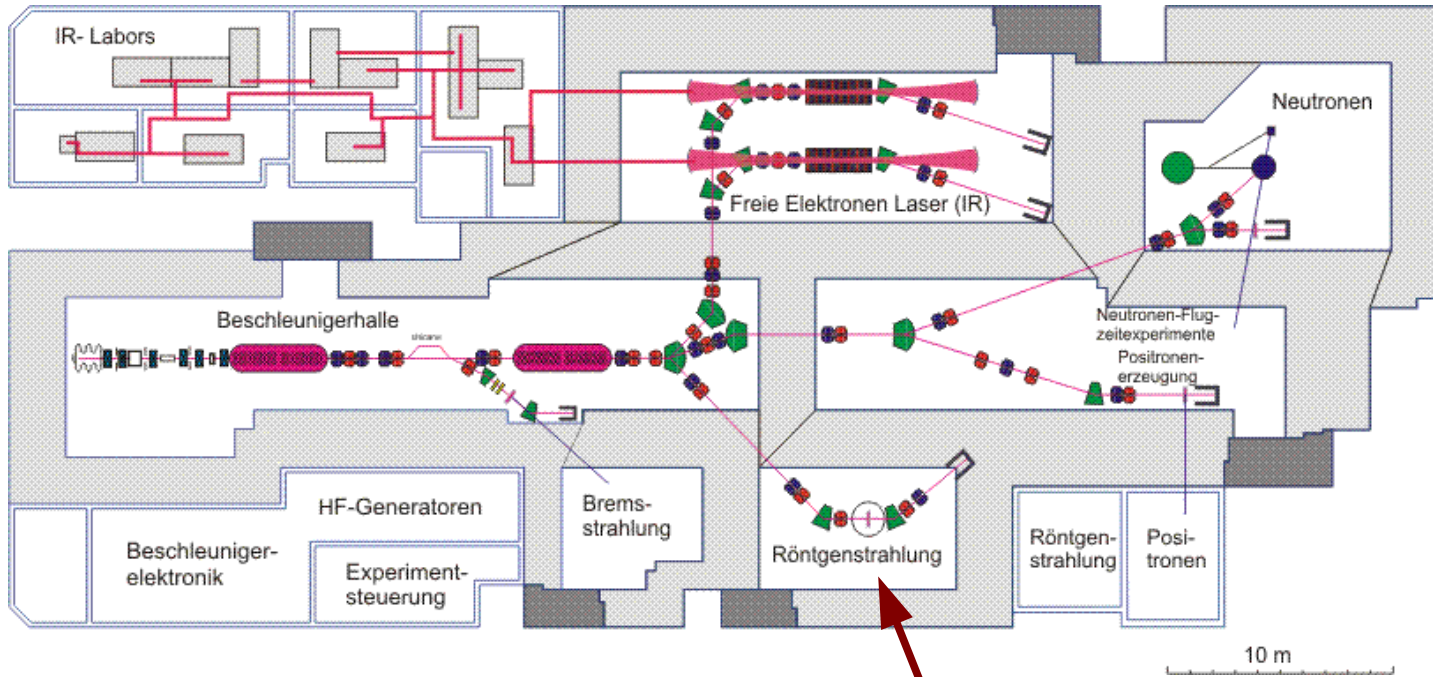
Overview

- ELBE
- Status of last year
- Search for new materials
- Recent experiments at ELBE
- Summary and outlook



Where the Experiments take place:

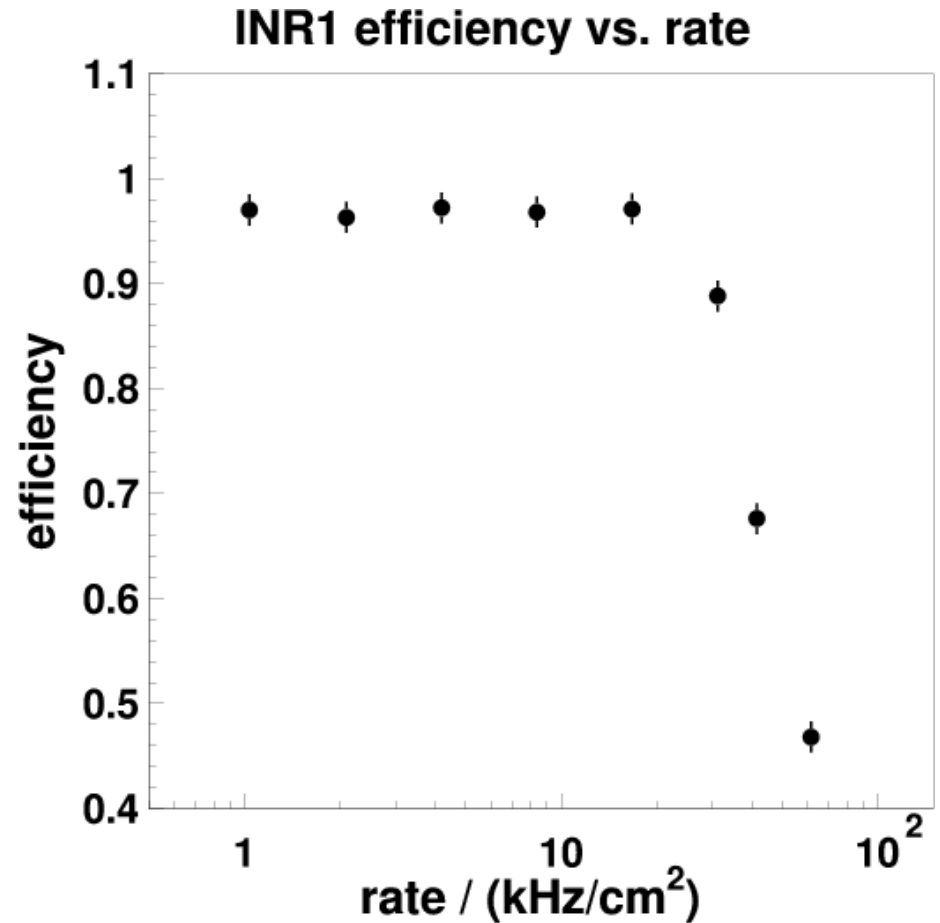
ELBE - **E**lectron **L**inac for beams with high **B**riiance and low **E**mmitance



Radiation physics Cave

Status last year

- one RPC prototype from INRI with low resistivity silicate glass tested:
 $5 * 10^8 \Omega \text{ cm}$, 4 gaps
- one RPC from FZD with float glass tested:
 $10^{13} \Omega \text{ cm}$, 4 gaps

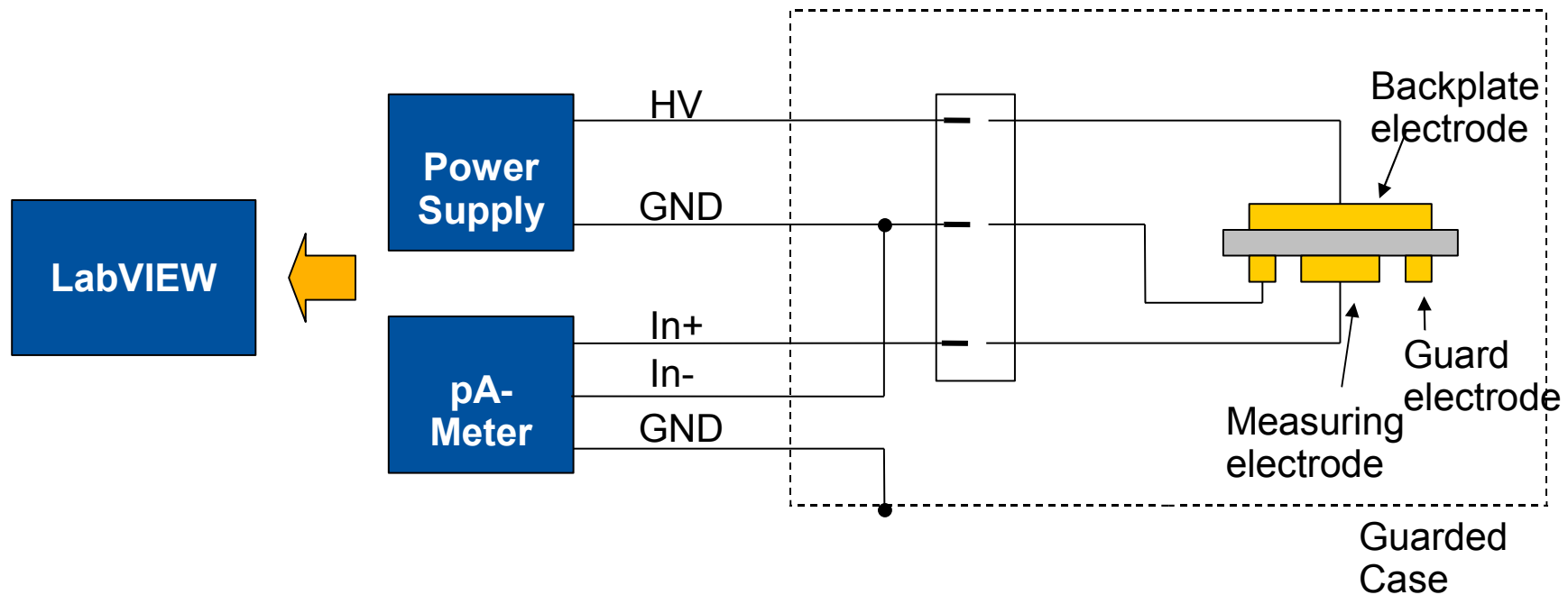


New materials

- Why?
 - Promising results from low resistivity glass
 - But not commercially available only small samples from lab
- Need for commercially available material in large quantities
 - Requirements:
 - easy to machine
 - mechanical stable
 - chemical stable against used gases
 - resistivity easy adjustable in a wide range : $10^5 \cdot 10^{12} \Omega \text{ cm}$
- Choices:
 - Plastic : Vestamid · Degussa / formed by ZIK; Permastat · RTP Company, Minnesota USA
 - Ceramic : Fraunhofer IKTS, Dresden

Principle method used for resistivity measurement

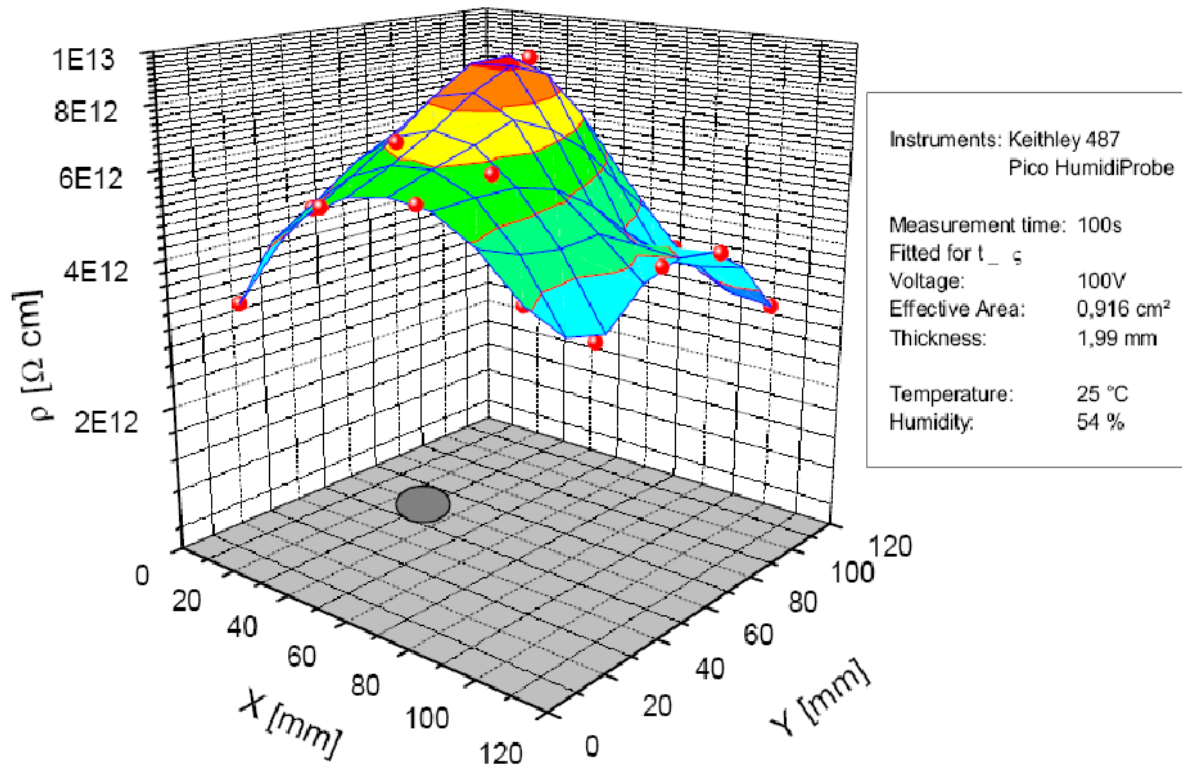
Problem: volume resistivity is not known for many materials and it requires some effort to measure it



Follows DIN VDE 303 Teil 30

Resistivity measurements

Volume Resistivity over Sheet VR7-1



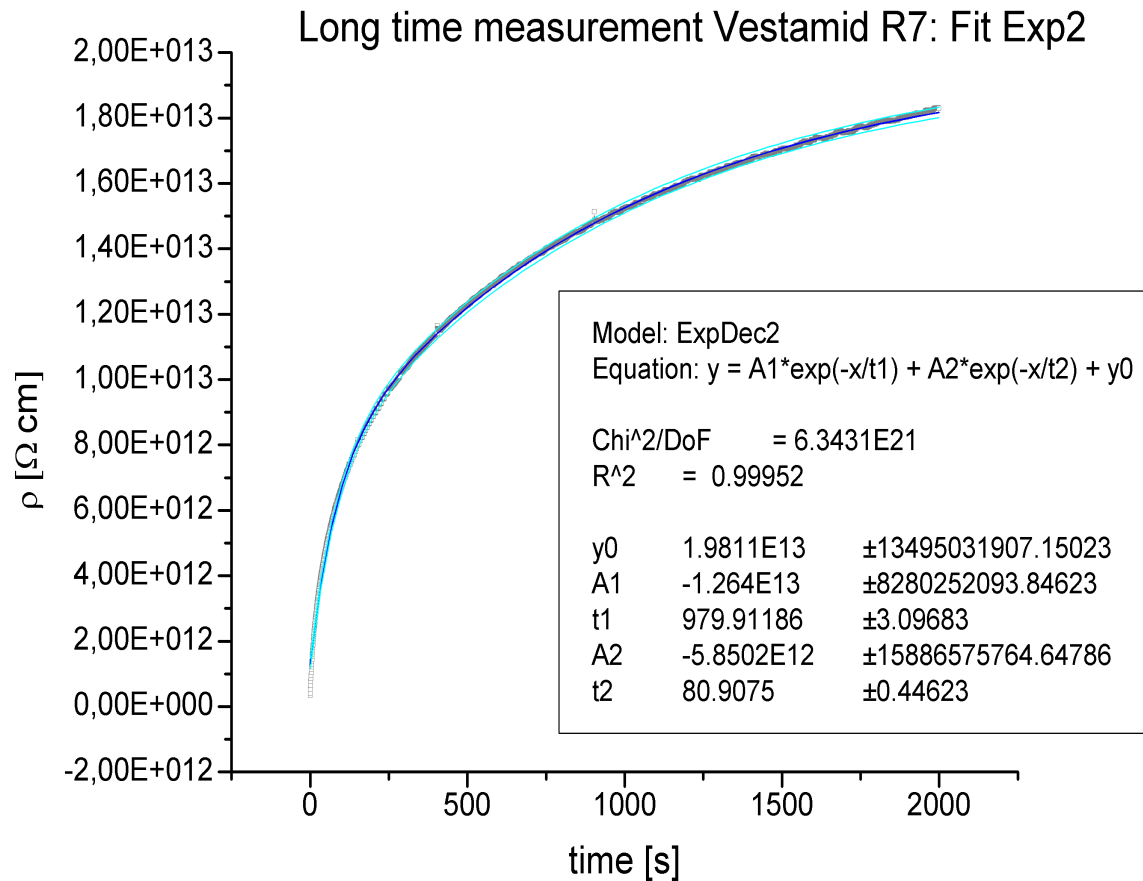
Material:

- Vestamit
- plate produced by casting

Effects:

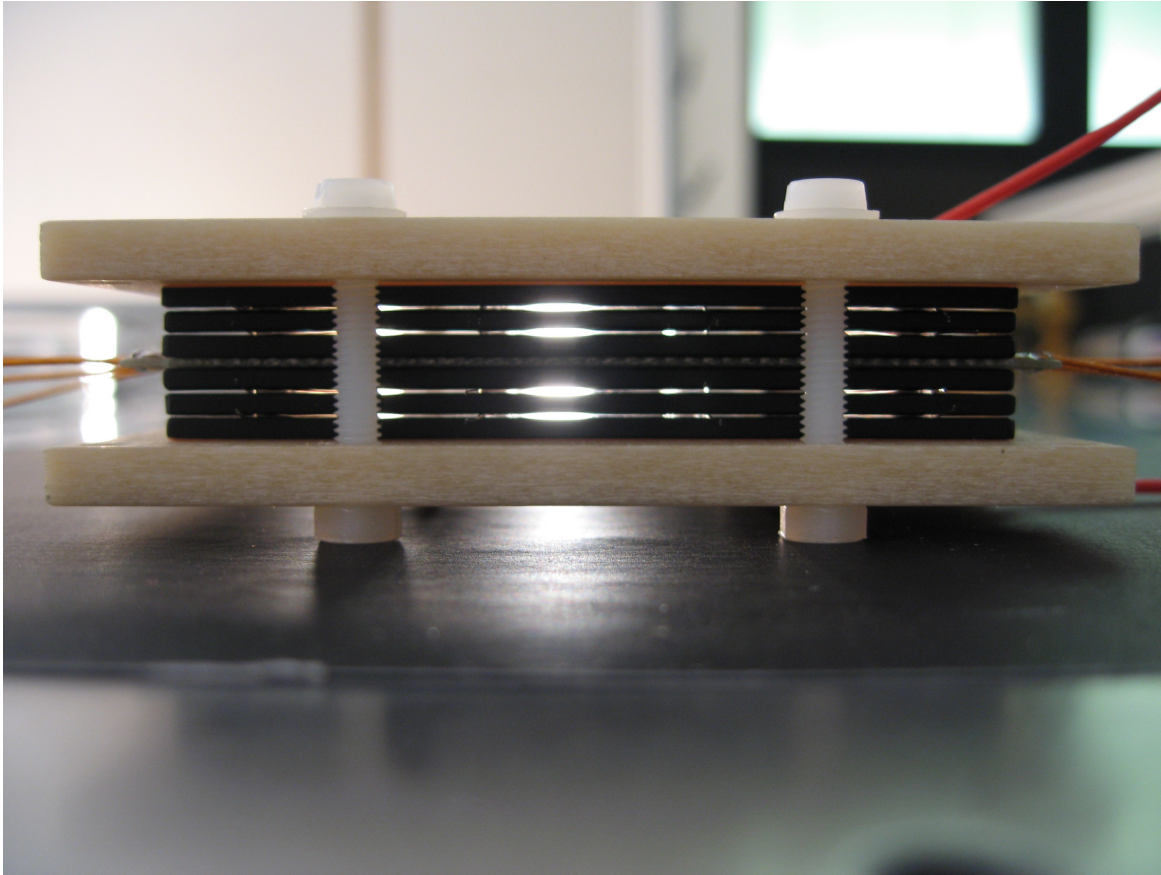
- Decrease at the borders
- strong influence at material inlet into the form

Long term stability

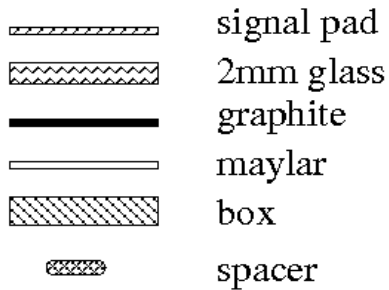
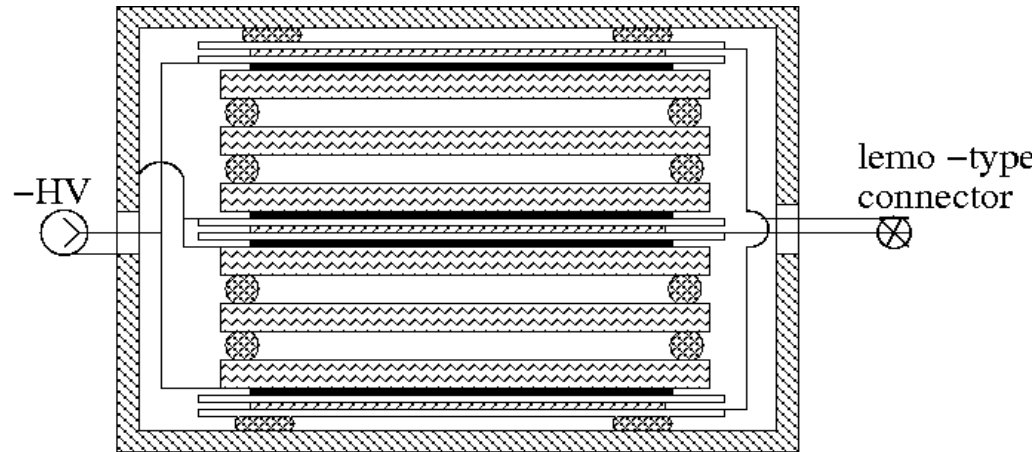


- Shows expected behaviour
- fit with two time constants

Construction of FZD - RPC



Prototype RPC schematics (IHEP)



Used types:

- one readout pad, pad size $3 * 3 \text{ cm}^2$
 - 0.3 mm single gap,
glass resistivity $5 * 10^8 \Omega \text{ cm}$
 - 0.3 mm single gap,
glass resistivity $3 * 10^{10} \Omega \text{ cm}$
- four readout pads, $2.8 * 2.8 \text{ cm}^2$
 - 0.3mm 6 gaps,
glass resistivity $10^{11} \Omega \text{ cm}$
- size of glass $6 * 6 \text{ cm}^2$
- active aerea $5.4 * 5.4 \text{ cm}^2$

Summary and outlook

- Test stand for resistivity measurements has been set up
- First test with plastic material with low resistivity
- Measurements to be done:
 - plastic with low resistivity coating (aging?)
 - ceramics with low resistivity
- Next beamtime
 - December 2007