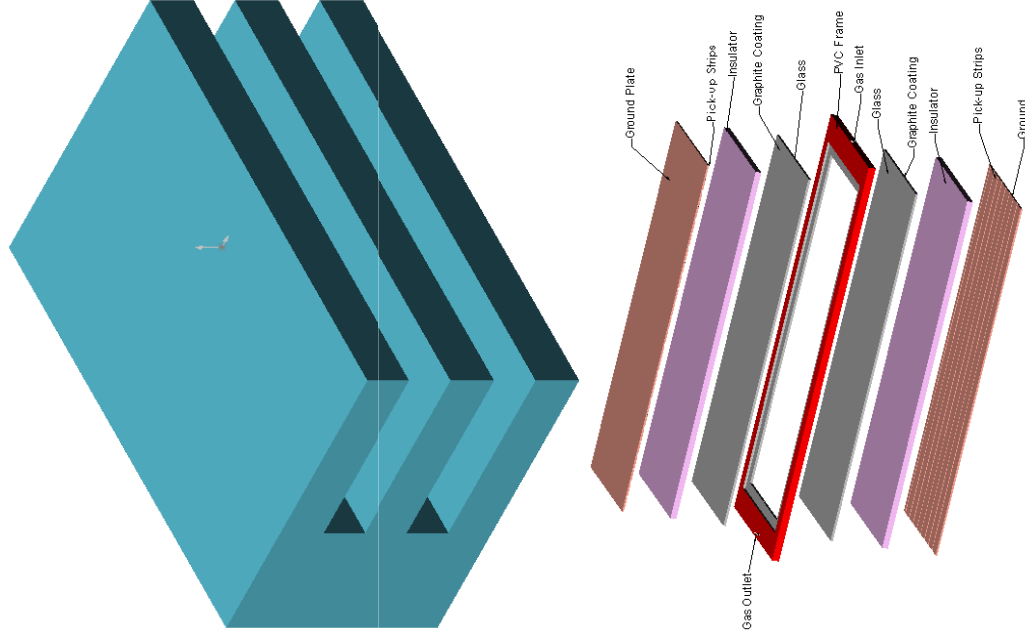


B.Satyanarayana, TIFR, Mumbai

**2m x 2m RPCs:
At the finishing line!**

RPC R&D at TIFR: Scaling up



Glass electrode preparation

Glass cleaning



Spray painting

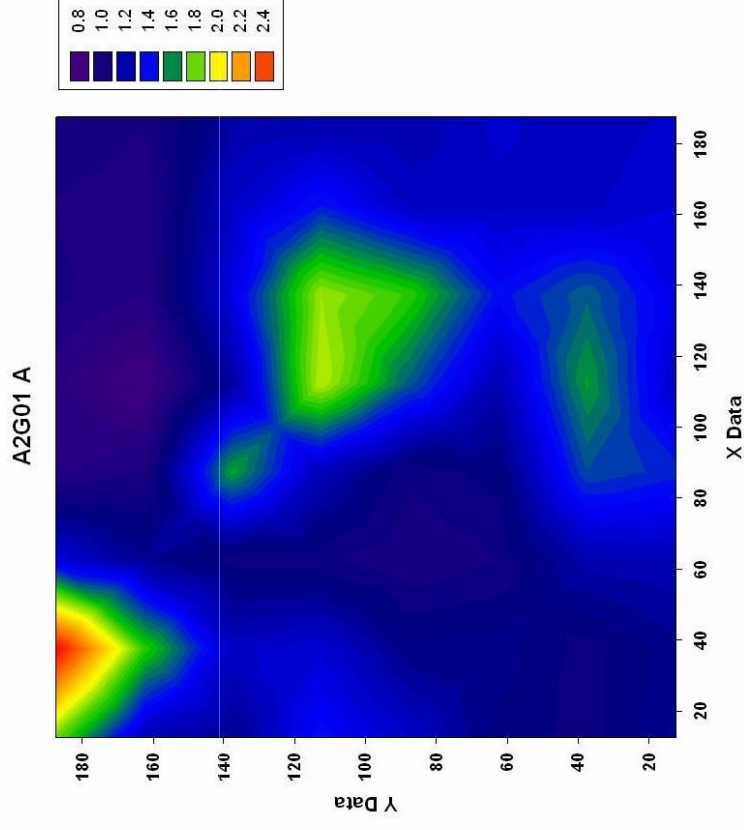


Surface resistivity measurement

Measurement jig



Measurement data



2m x 2m RPC: Gas gap preparation - 1

Bottom glass in place



Gluing of buttons

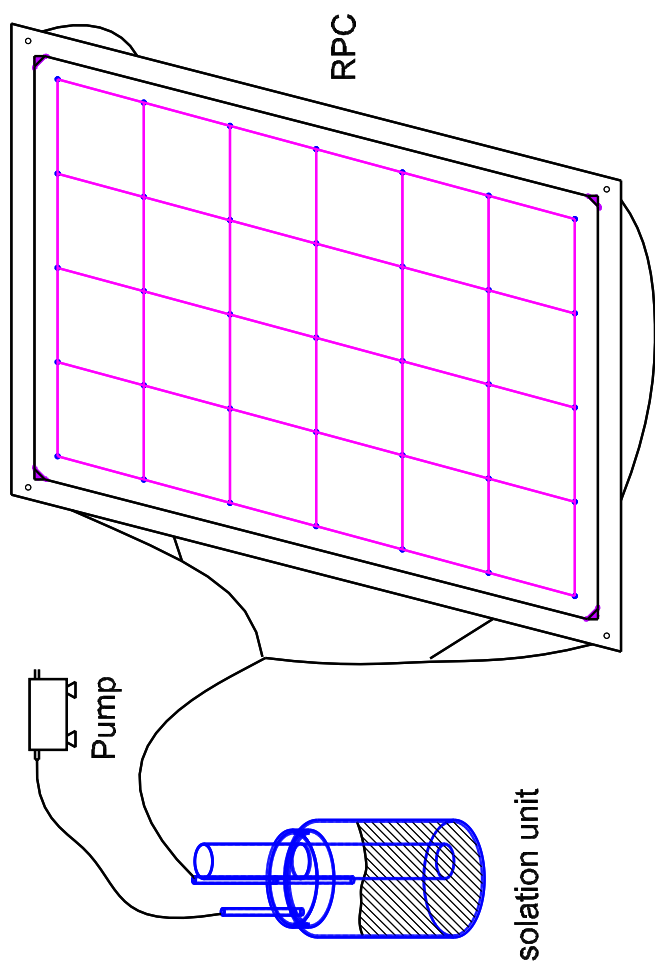


2m x 2m RPC: Gas gap preparation - 2

Placing the top glass



Vacuum jig for gluing



2m x 2m RPC: Gas gap preparation - 3

Ready to glue top-side spacers



Turning table to glue bottom-side spacers



2m x 2m RPC: Gas gap preparation - 4

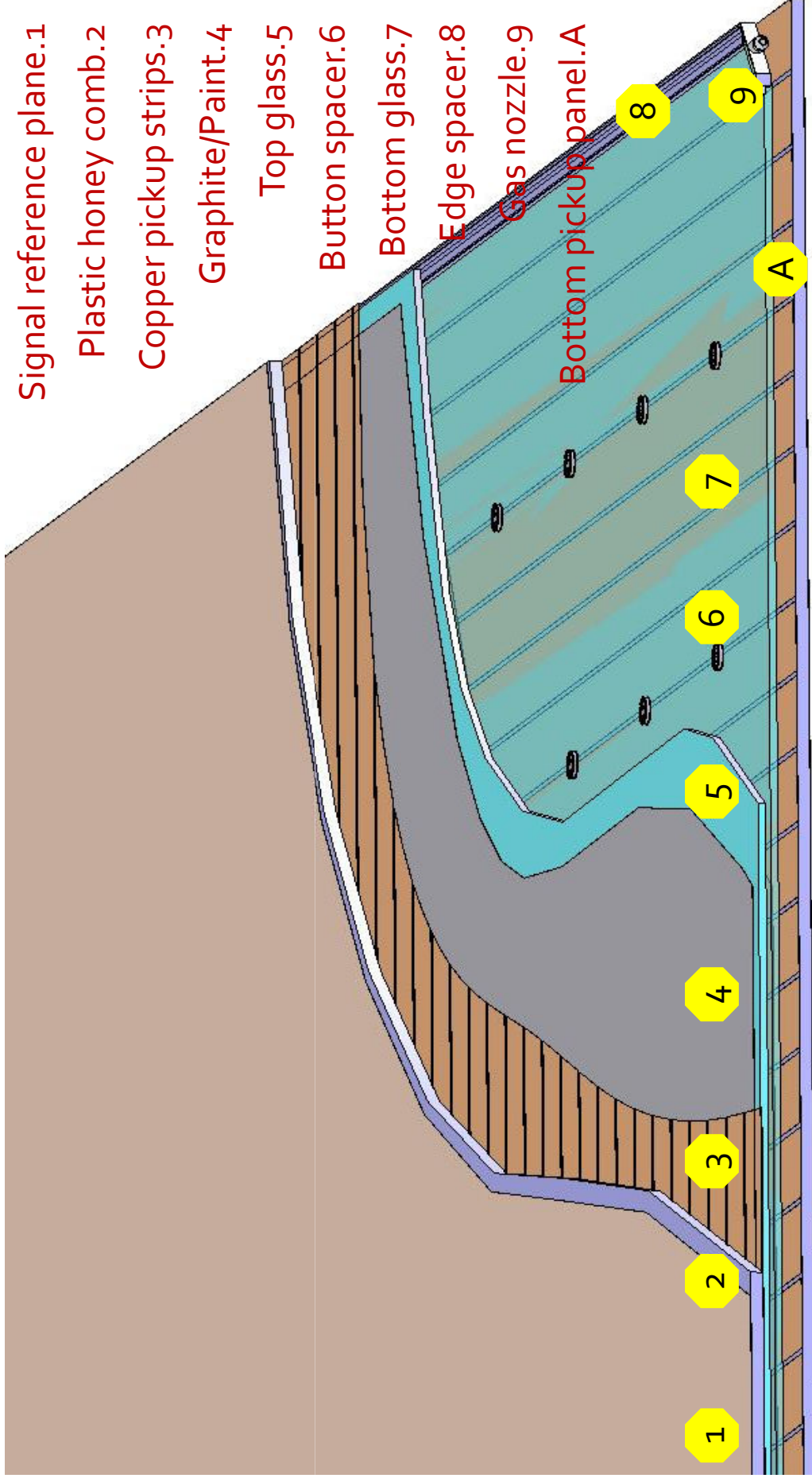
Leak testing the gap



Fully fabricated gas gap; ready to be assembled



Construction of an RPC detector

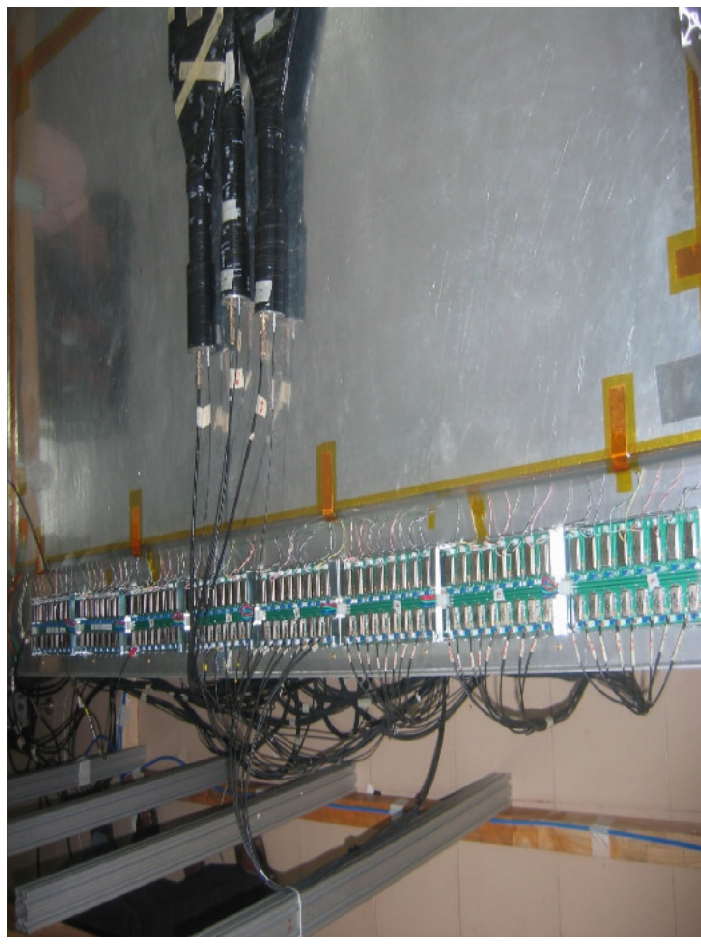


2m x 2m RPC in the Cosmic test stand

Cosmic test stand

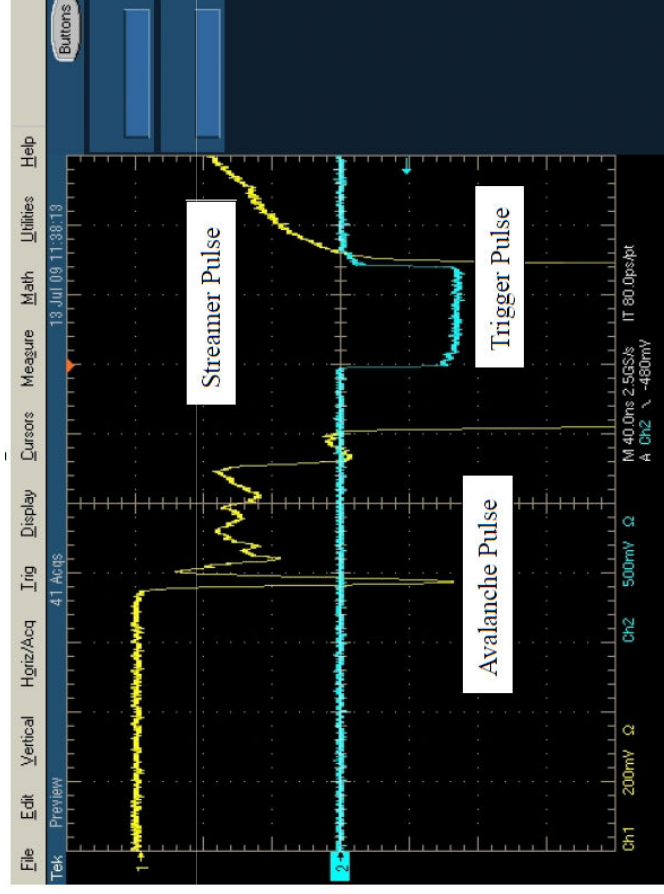


Front-end electronics

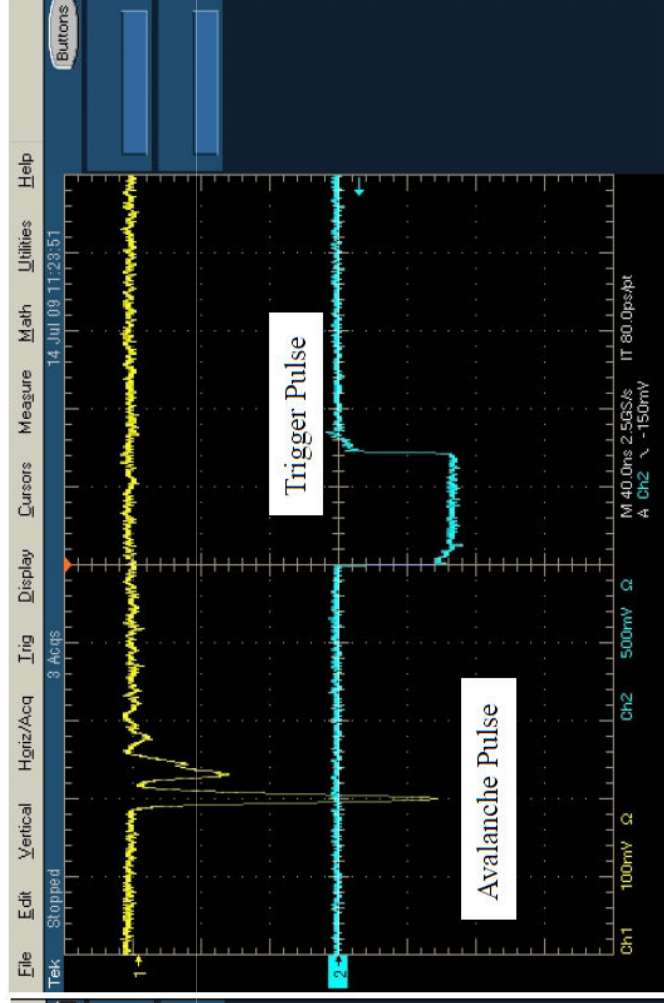


SF₆ studies: RPC pulse profile

$$SF_6 = 0\%$$

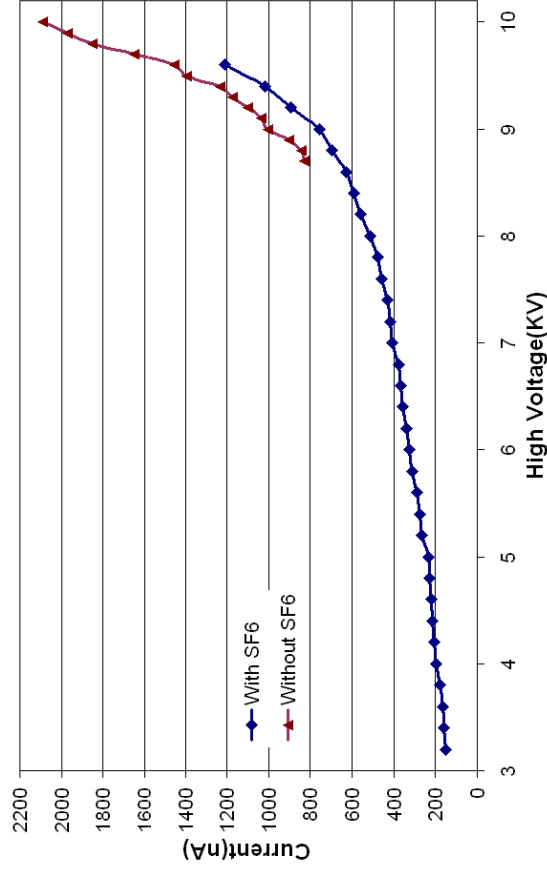


$$SF_6 = 0.32\%$$

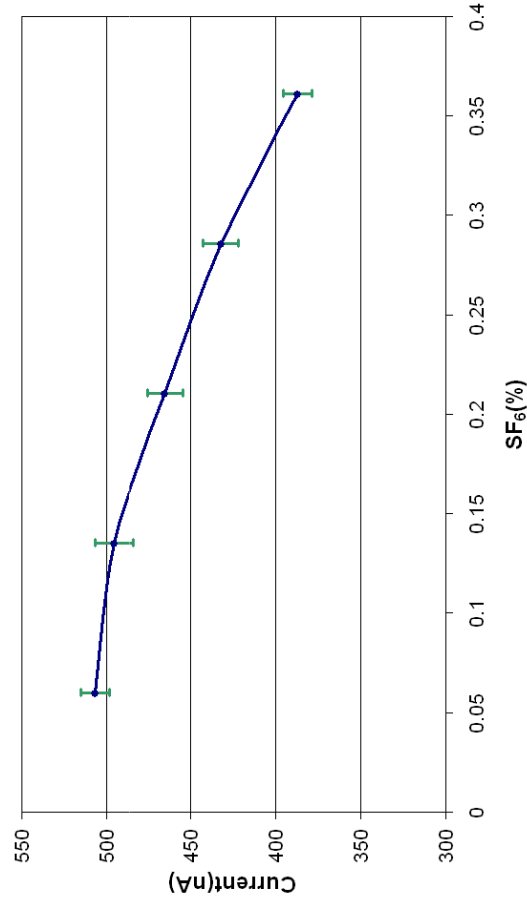


SF₆ studies: Chamber current

V-I characteristics

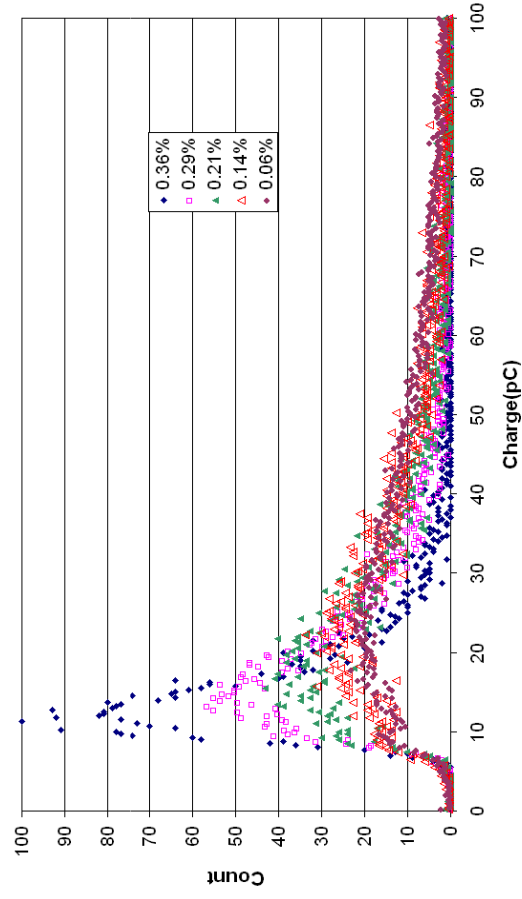


Chamber current

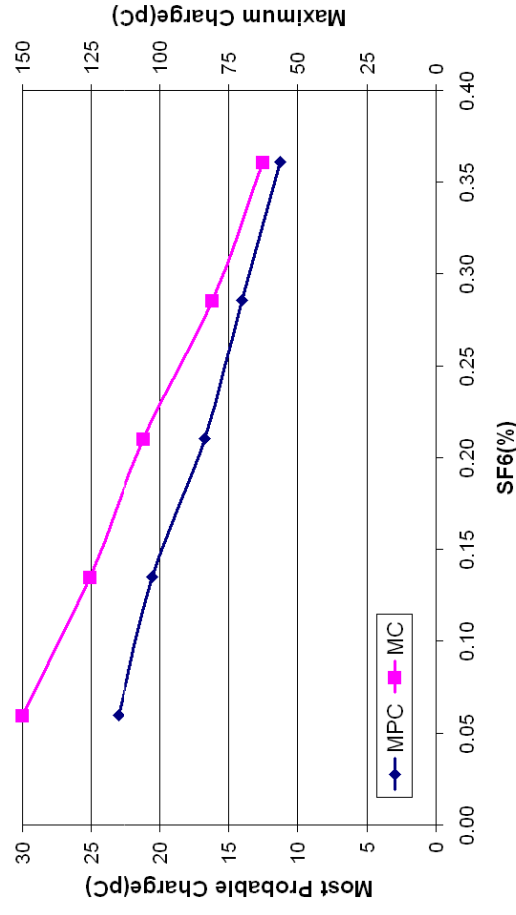


SF₆ studies: Collected signal charge

Charge distributions

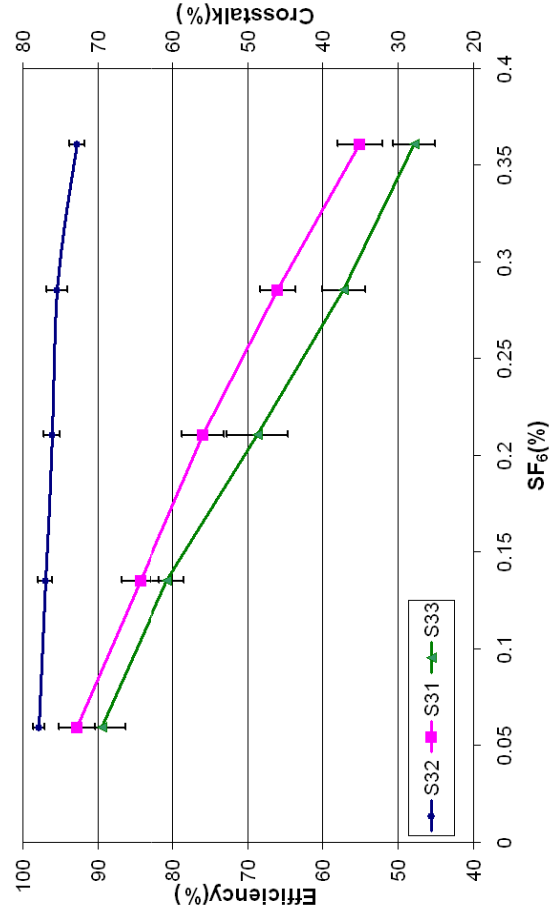


Charge parameters

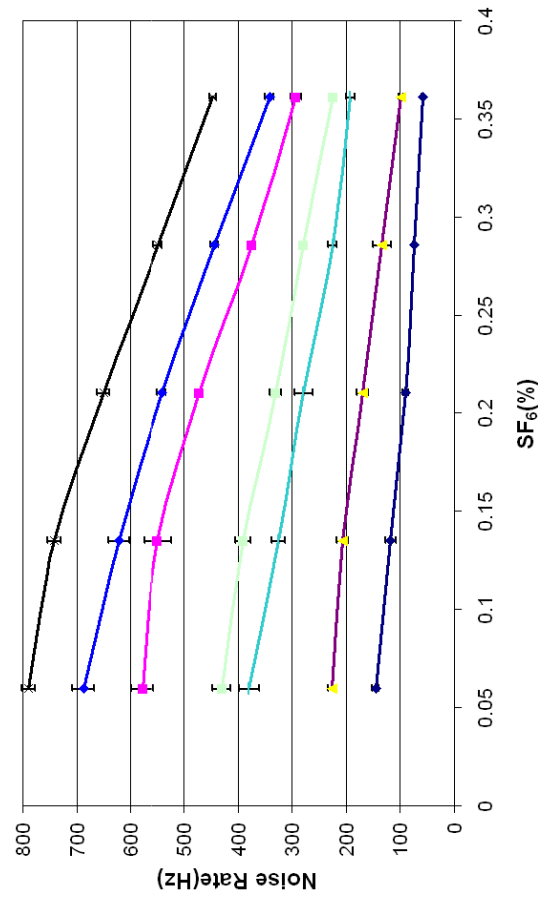


SF₆ studies: Important operating parameters

Efficiency

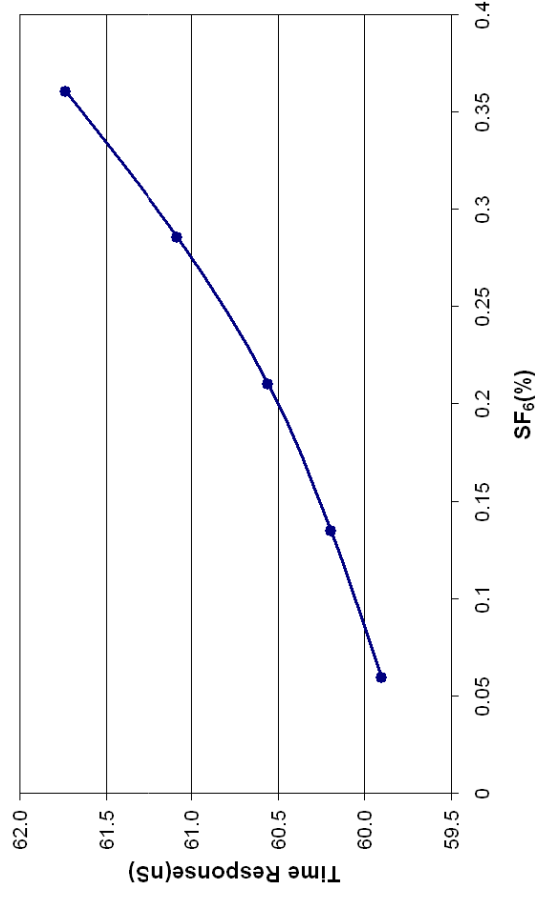


Noise rate

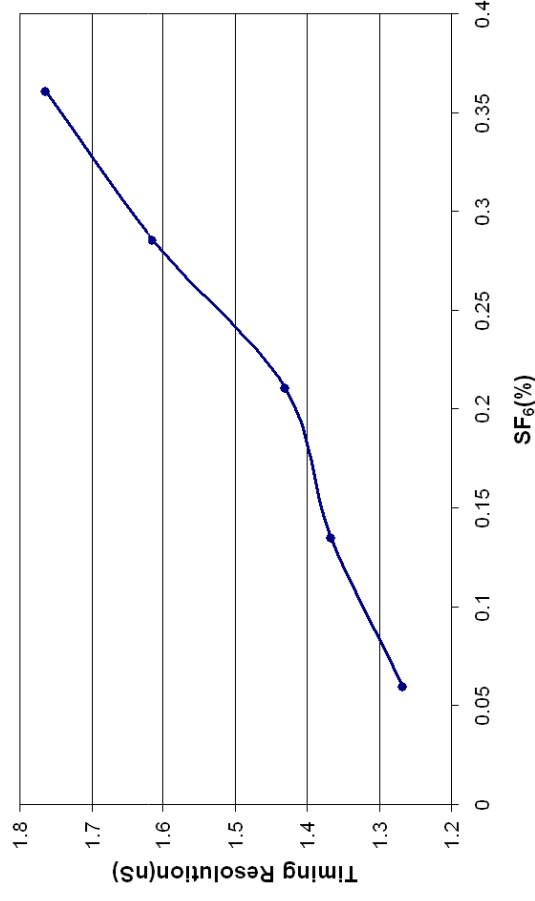


SF₆ studies: Timing characteristics

Time response

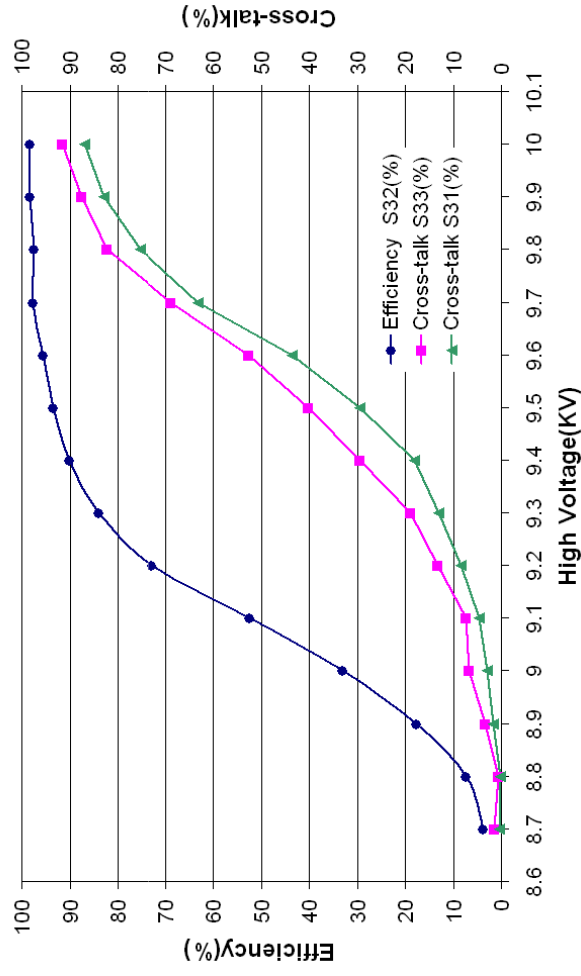


Time resolution

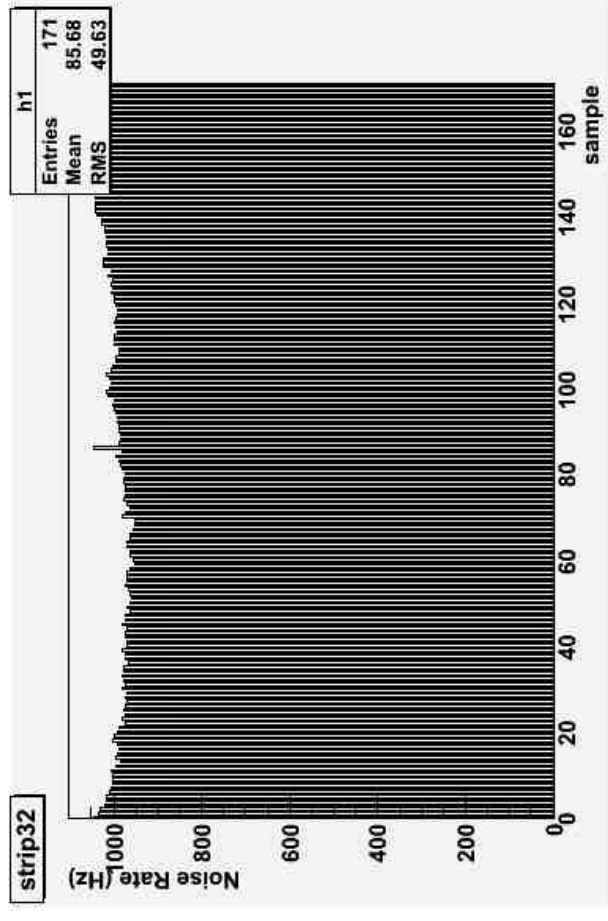


Monitoring operating parameters

Efficiency plateau

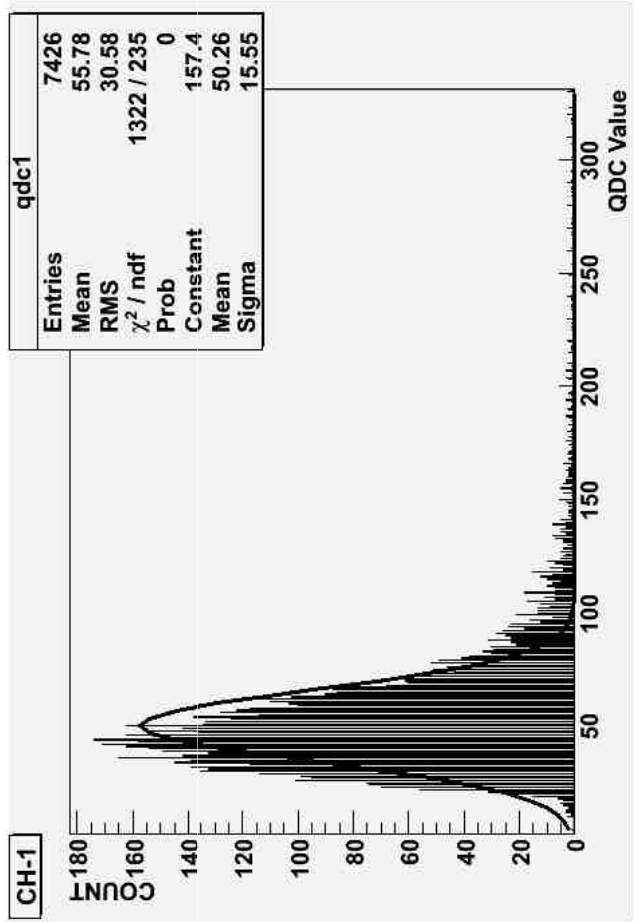


Noise rate profile

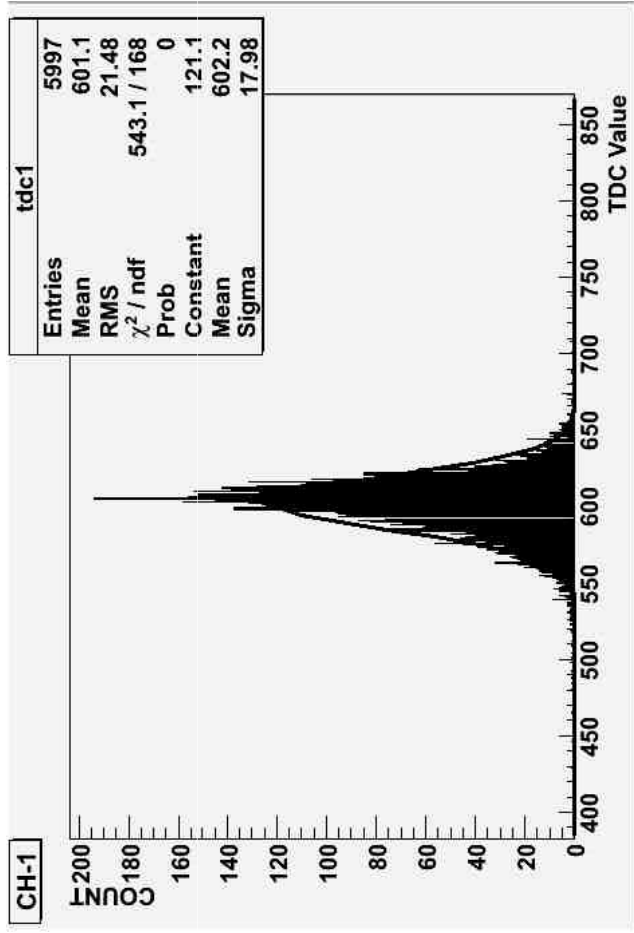


Charge and time distributions

Charge



Timing



Future plan

- More 2m x 2m to be made; at least three more
- Installation and commissioning of electronics
- Common, large area cosmic telescope setup
- Timing studies with long pickup strips
- Gas systems studies with RGA
- Cascading of gas lines; optimisation of gas flow
- Studies using new pickup panel designs
- Essentially –
 - *BigStack* for long-term, cosmic, tracking studies etc.
 - New lab for optimising RPC design for industrial production and testing for ICAL operating conditions

The TIFR RPC R&D team

