

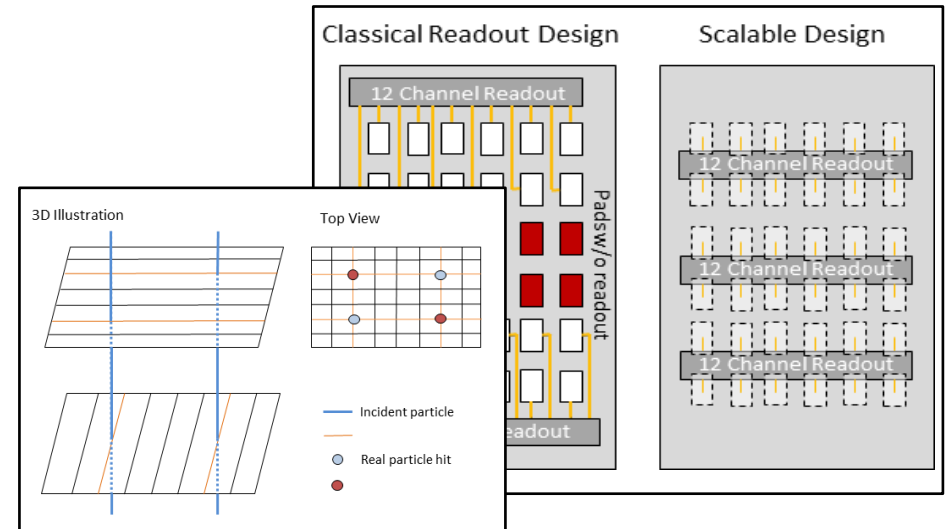
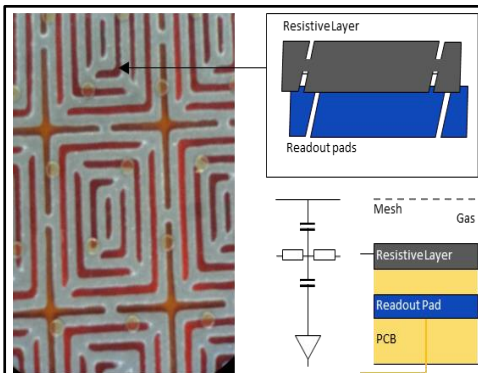
Development and Tests of Micromegas PAD-Detectors for High Rate Environments

Motivation

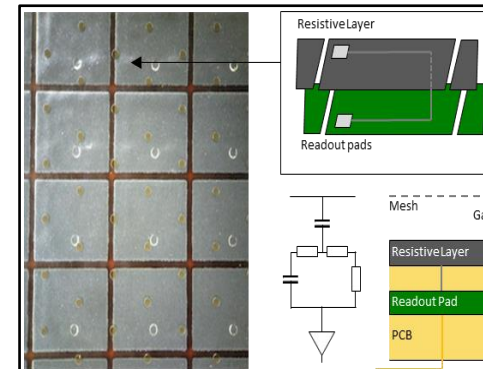
- 2D-Strip-Detectors show ambiguities in high-rate environments
 - Solution: Pad readout structure (4x5 mm²) with scalable readout design

Detector design

- Capacitive coupling between resistive layer and readout layer

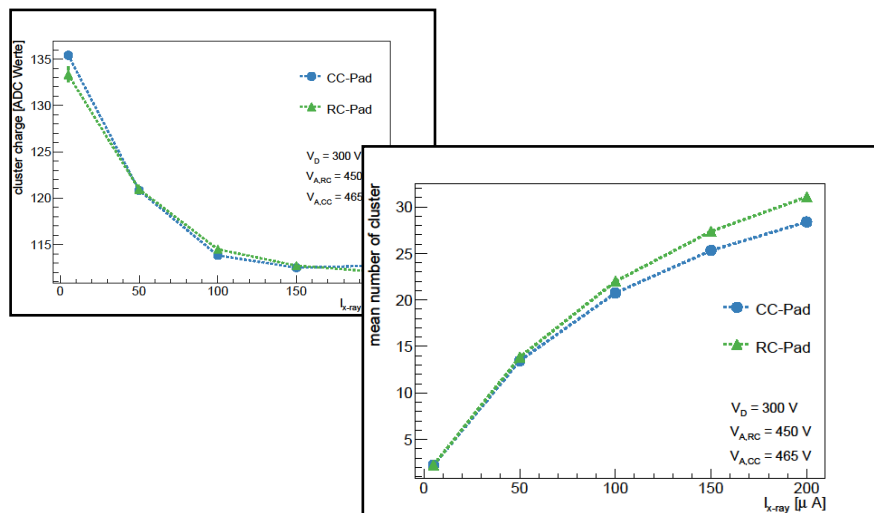


- Resistive coupling of independent resistive pads per readout pad



High rate performance

- Decrease of gain with increasing rate
 - **Screening of field** by free charges
- Saturation in number of cluster starts earlier for CC-Detector
 - longer decay time leads to longer screening



Conclusion

1. Development of Micromegas-Detector with **Pad-Readout** to solve ambiguities of large 2D-Strip-Detectors in high-rate environments
2. Implementation of **capacitive and resistive coupling** between resistive layer and readout layer
3. Resistive coupled detector shows smaller cluster size due to **decoupled resistive pads**
4. High rate test shows **faster charge spread in resistive coupled detector** resulting in better efficiency at high rates