Objective
CBM experiment at FAIR, Darmstadt, Germany: 2-45 AGeV nucleus-nucleus collisions with up to 10 MHz interaction rate
- test radiation tolerance \(2 \times 10^{14} \text{n}_{eq}\text{cm}^{-2}\), max. lifetime for STS of sensor prototypes for CBM-STS
- compare interstrip connection schemes for strips with stereo angle
  - double metallization (DM) or single metal with external cables (SMwC)
- annealing studies

Device under test
- double-sided sensors, p-n-n structure
- 1024 strips per side with 58 \(\mu\text{m}\) pitch, stereo angle front-back sides 7.5°
- SMwC or DM on the stereo angle side
- integrated AC-coupled read-out

External routing line
“SMwC”

Vs.

Integrated routing line
“DM”
Experimental set-up

Tests performed
- leakage current vs. bias
- long term stability
- capacitance vs. bias voltage
- charge collection with $^{90}$Sr source
- measurement temperature $-5 \pm 3^\circ C$

Annealing studies

Results

- DM and SMwC sensors shows similar charge collection both before and after irradiation
- after irradiation ~25% and ~10% charge collection losses seen for Hamamatsu & CiS sensors resp.

Annealing studies performed on small sensors ($1\times1\text{ cm}^2$)
- no charge collection losses seen till 1 year at $20^\circ \text{C}$ because of high operating voltage