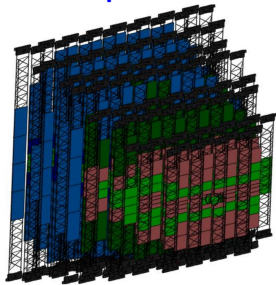
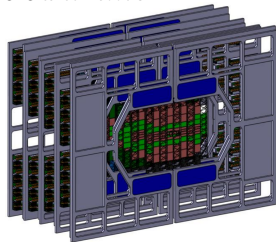


Introduction

CBM experiment is dedicated for studying **rare probes** at moderate energies



STS carbon ladders

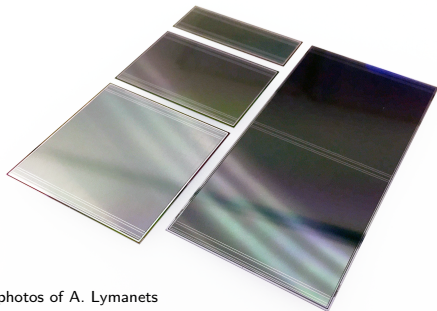


STS units (drawings of O. Vasylyev)

- **Silicon Tracking System** is a core tracking detector of CBM
 - ▶ momentum resolution $\Delta p/p \simeq 1.5\%$
 - ▶ hit efficiency $\gtrsim 95\%$
- Technical challenges:
 - ▶ ultra low material budget ($\simeq 8\% X_0$)
 - ★ electronics outside of acceptance
 - ★ connected to sensors with microcables
 - ★ double-sided sensors
 - ▶ occupancy up to 10 MHz/cm^2
 - ▶ self-triggering electronics
 - ▶ hundreds of sensors to be checked:
 - ★ QA procedures are required
- Operational conditions:
 - ▶ $1 \text{ T} \times \text{m}$ magnetic field
 - ▶ constant temperature of -5° C maintained

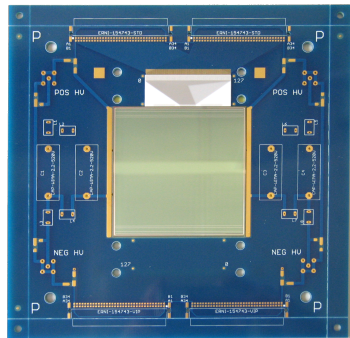
Silicon micro-strip sensors

- Sensor characteristics:
 - ▶ n-type silicon
 - ▶ double sided, 7.5° strip inclination angle on p-side
 - ▶ $300\text{ }\mu\text{m}$ thick, $58\text{ }\mu\text{m}$ pitch
 - ▶ required radiation hardness $2 \times 10^{14} \text{ 1 MeV n}_{\text{eq}}/\text{cm}^2$
- Two vendors: CiS, Hamamatsu



photos of A. Lymanets

$6.2 \times 6.2 \text{ cm}^2$ microstrip sensor
inside the supporting PCB frame

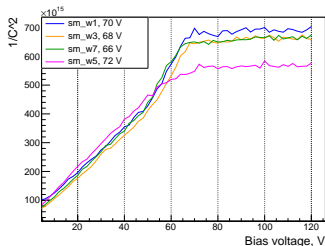


- Various sizes ($\simeq 1000$ in total):
 - ▶ $2.2 \times 6.2 \text{ cm}^2$ (tens)
 - ▶ $4.2 \times 6.2 \text{ cm}^2$ ($\simeq 300$)
 - ▶ $6.2 \times 6.2 \text{ cm}^2$ ($\simeq 300$)
 - ▶ $12.4 \times 6.2 \text{ cm}^2$ ($\simeq 300$)

Tests with sensors and electronics

- QA procedures:

- ▶ optical inspection
- ▶ electrical tests:



- R&D studies in a laboratory

- ▶ irradiated/non-irradiated sensors
- ▶ tests with β source
- ▶ electrical tests
- ▶ laser tests (to be implemented)

- Proton beam tests

- ▶ ultimate test of the integrated system
- ▶ COSY accelerator in Jülich
- ▶ 1.7 GeV/c protons in August 2016

