SAS meeting. GBP updates 05/08/24

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LUXE

Updates

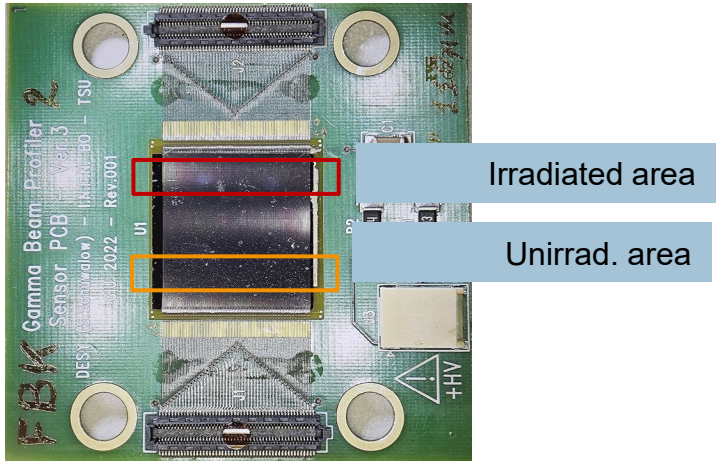
- Performance of the 192-strip vs. accumulated dose
  - Target of 10MGy with 200MeV e-beam at CLEAR (CERN). Managed to irradiate 3.5MGy due to unforeseen issues during the experiment. Planned to continue in Sept. ‘24.
  - Special beam setup, with W collimator, irradiating only half of the sensor.
  - Relative CCE is obtained by comparison between irradiated and reference (shielded un-irrad.) area

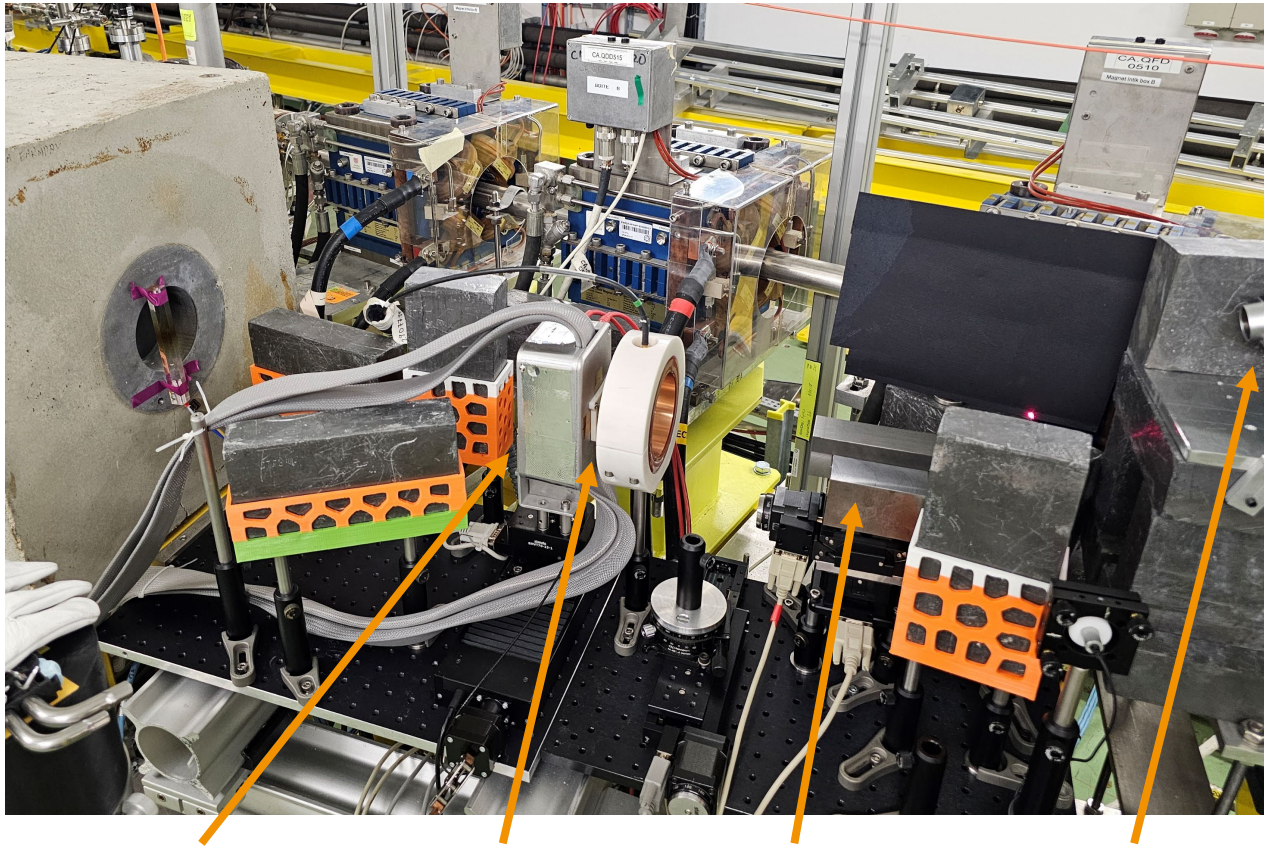
- Experiment continuation in Sept.’24 with
  - irradiation up to 10MGy
  - test of micro-coaxial cables + new patch panel – i.e., profile distortions are expected to be greatly improved

Test beams. GBP 192-strip sensors. Scope and setup

- **Goals**
  - Test of new FBK sensors (strip resistivity) under high irradiation (up to 10MGy).
  - Measure detector response as a function of the radiation damage.

- **Setup (CLEAR, CERN)**
  - Stack of 2 parallel-oriented 192-strip FBK sensors.
  - Tungsten collimator protecting half-sensor from irradiation.

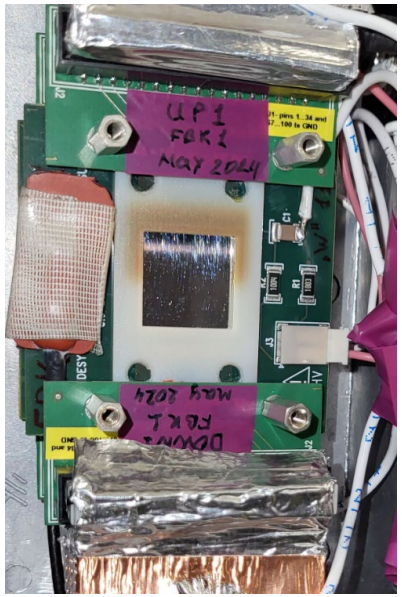




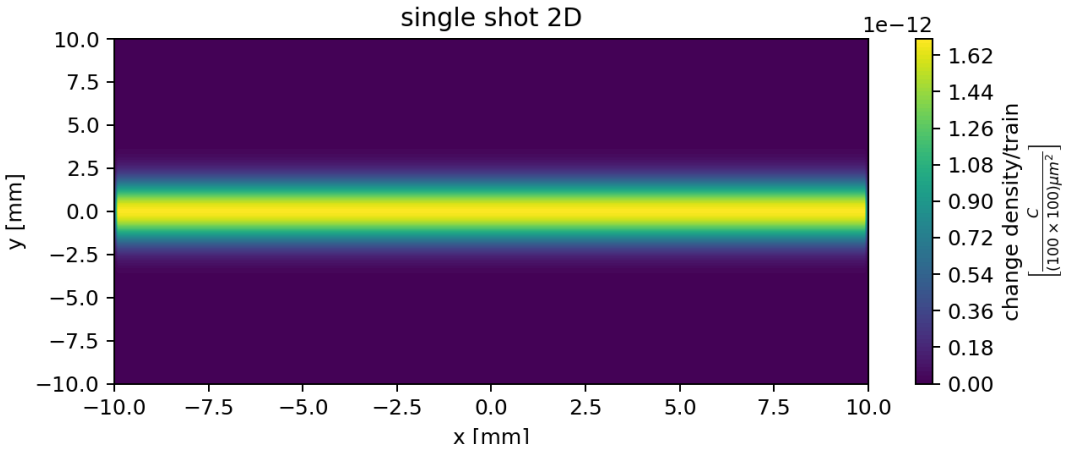
Test beams. GBP 192-strip sensors. Scope and setup

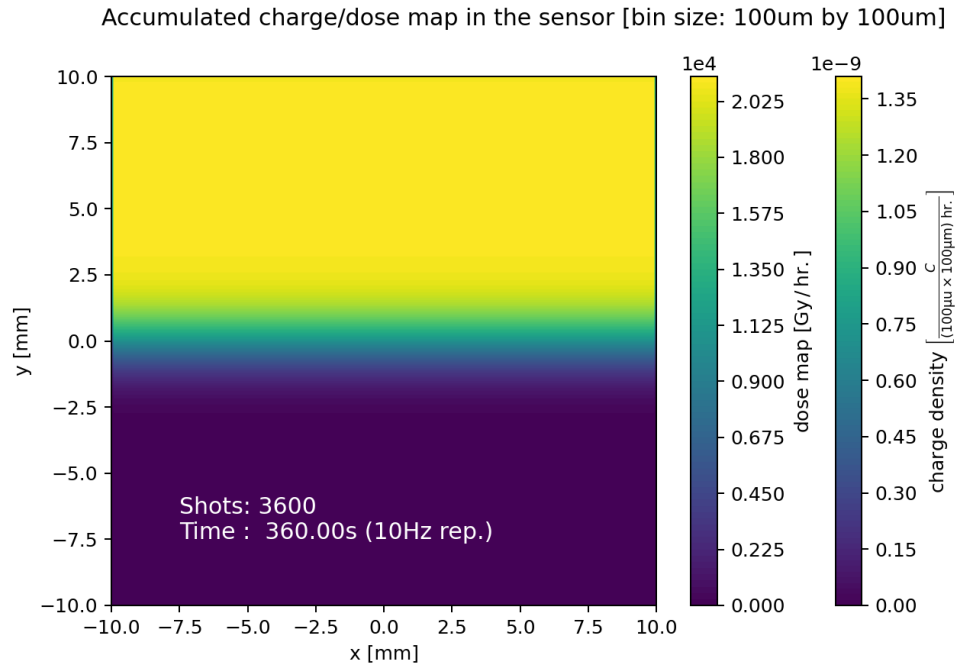
- **Setup (CLEAR, CERN)**
  - Stack of 2 parallel-oriented 192-strip FBK sensors.
  - Tungsten collimator protecting half-sensor from irradiation.
  - Horizontal flat-top beam shape used for uniform detector irradiation in the upper part.

0 MGy



3.4 MGy



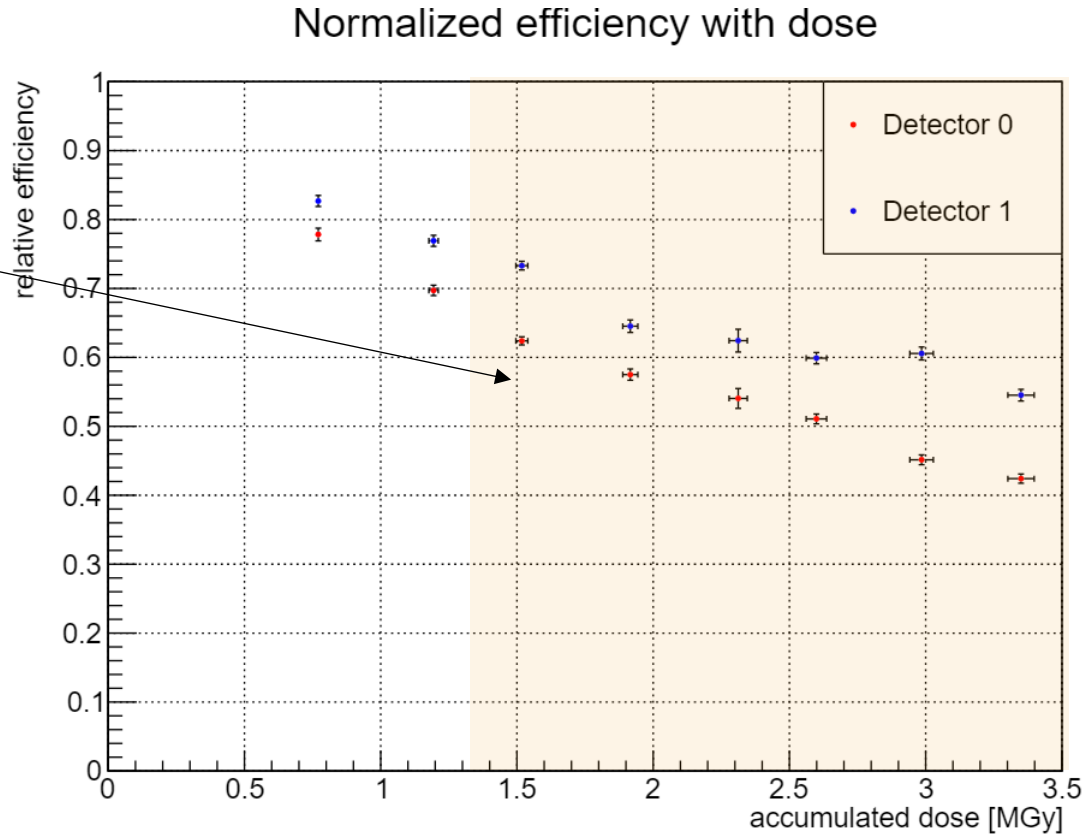


Test beams. GBP 192-strip sensors. Result (preliminary)

- These statistical errors are much smaller than the systematics of some runs.
- Most of the time without information about the beam shape on the sensor (orange region).
- The expected law is exponential-like but not exponential, rather this is the dependence of the relaxation time

$$\lambda(D) = \frac{1}{(\alpha + \beta D)^{\gamma}}$$

with D the accumulated dose, and the parameters comparing depending on the detector characteristics and HV bias field.



- Relative efficiency = (mean readout charge 64ch) / (mean beam charge)

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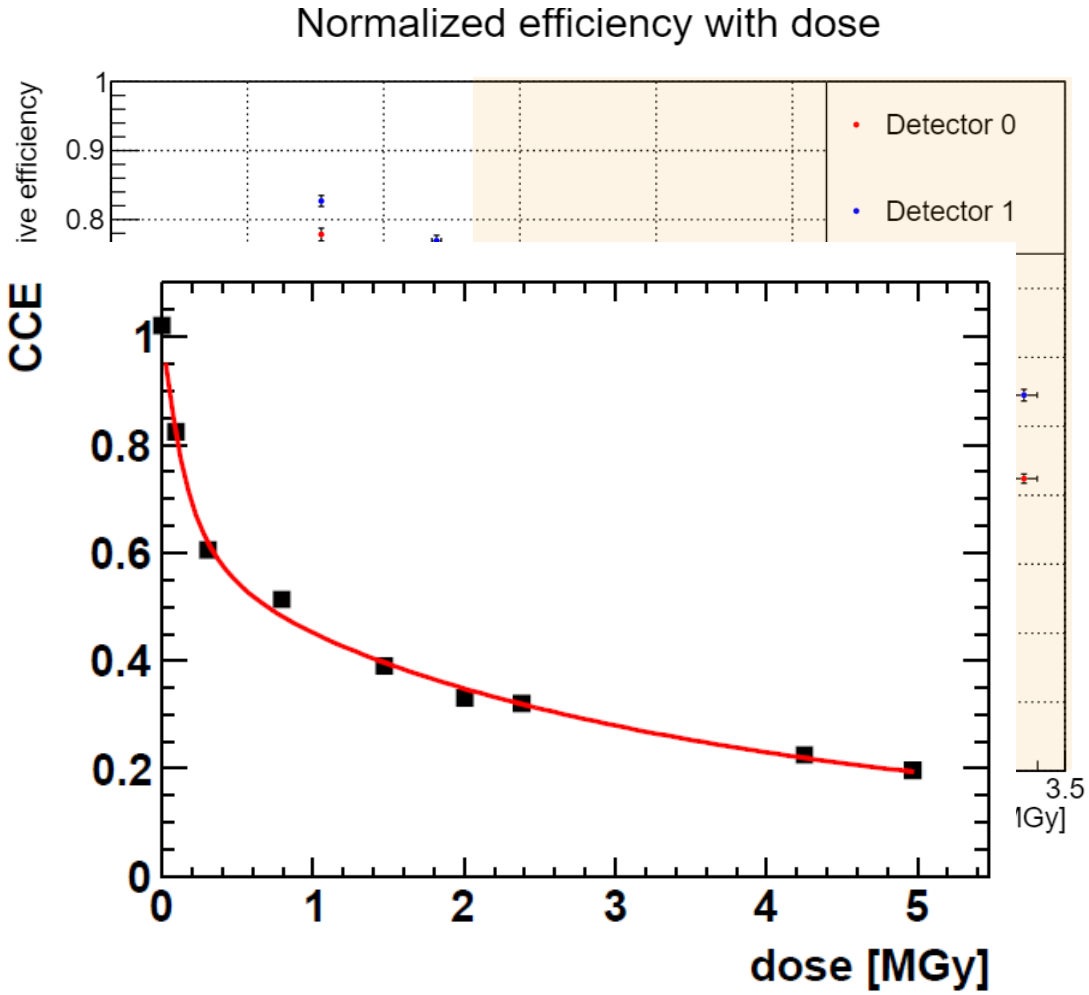
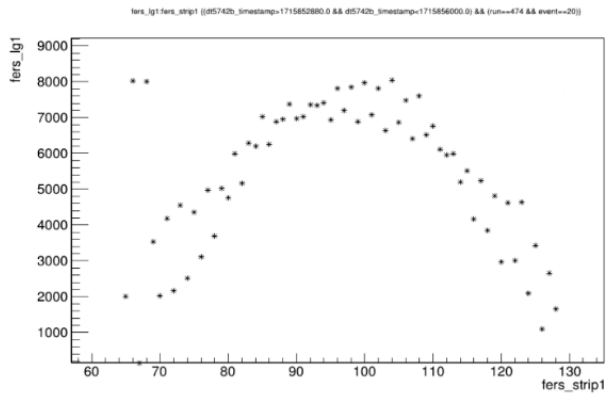
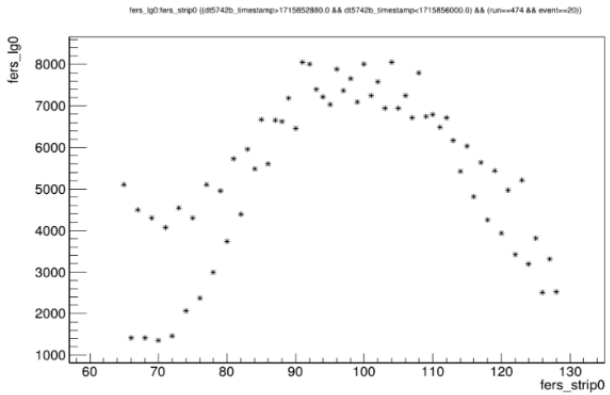


profiles

upstream fers_lg1	downstream fers_lg0
	
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