

Feedback on 2022 SPS-H6 test beams for EP Pixel R&D

Using permanent EP R&D Timepix3 telescope installation at the end of SPS-H6B for **high-rate tests of small-area pixel-detectors and test structures** ($500 \mu\text{m}^2 - 200 \text{mm}^2$)

Observations in 2022:

- **Excellent support** from beam-line physicists for beam tuning – [thank you Dipanwita!](#)
- **Very good collaboration** with upstream users during high-rate beam periods
 - telescopes well aligned and rather stable DAQ in most setups
 - efficient communication for beam conditions and accesses using H6 Mattermost channel
- **Rate limit** in H6 from **radiation levels**: $\sim 3-5 \times 10^6 / \text{spill}$ → depends on supercycle + H8 conditions
- **Critical radiation levels** are in PAXNA12612 (above shielding), PAXNA14612 (bridge btw. H6A and H6B) and in neutrino-platform area behind H6

Wishes for 2023 and beyond:

- **Beam-rate increase** by factor >10 would be advantageous for our small-area test programme
- Alternatively: **decrease of beam size** from the current $\sim 8 \text{ mm RMS}$ in x and y to $<2 \text{ mm RMS}$
→ physical limits t.b.c.; trade-off between rate, size, number of parallel users
- Long-term interest in **higher rates / micro-focused beams** also by other silicon-detector groups
→ prototyping phase often requires the testing of devices with very small active area
→ dedicated meeting for small-area devices on July 14 with 18 participants from 7 R&D projects
- Idea for shorter-term improvement: **automatic adjustment of rate** with observed radiation levels (higher instantaneous rates during periods with fewer spills / longer supercycles)?
- Other wishes: additional **beam-profile monitors** near H6B telescopes for easier beam tuning; possibility to run **Cesar** in monitoring mode on any (non-Windows) PC from remote