

- **CMS needs to be upgraded to face an unprecedented high-luminosity environment.** In particular, the tracker will be substantially replaced to sustain the foreseen high radiation levels.
- **3D pixel sensors** have proven to be the best option for the innermost layer of the tracker barrel pixel due to their harsh-radiation tolerance → **CNM is one of the main manufacturers.**

Hybrid pixel detectors: RD53A readout chip + n-in-p sensors



- **Irradiations up to a fluence of $2 \times 10^{16} \text{ n}_{\text{eq}}/\text{cm}^2$ and data taking in test beams at several facilities.**

- Irradiations: ITA with protons at 400 MeV, Strasbourg with protons at 23 MeV and KIT with protons at 25 MeV.
- Test beams: DESY with e-/e+ beam at 5 GeV, FERMILAB and SPS CERN with proton beams at 120 GeV.

