1. Performance characterization of AIDAInnova TI-LGADs

- IV–CV characterization of different designs and wafers
- Comparison of breakdown performance for different trench widths (TW) and trench versions
- Extraction and comparison of Vgl for the different designs
- Testbeam performance of selected structures, with focus on hit efficiency
- Evaluation of the fill factor, one representative 2D timing-performance map
- Conclusions from the testbeam campaign and discussion of the differences between trench designs

2. The impact of the trench design on charge collection

- Detailed study of the charge collected across the pixel and inter-pixel region
- Parameterization of the measured charge profiles
- Development of a common parameterization applicable to different TI-LGAD designs
- Evaluation of the effective width of the inter-pixel distance (IPD)
- Definition of a quantitative figure of merit for comparing different trench designs
- Discussion of the optimal trench configuration in terms of charge collection and active area

3. Performance of irradiated TI-LGADs in the testbeam

- Testbeam characterization of TI-LGAD structures after irradiation
- Study of detector efficiency as a function of bias voltage and fluence
- Spatial efficiency and charge-collection profiles across the pixel and trench regions
- Evolution of the effective IPD and fill factor after irradiation
- Study of structures measured at different incidence angles
- Dependence of efficiency and charge sharing on the track incidence angle
- Comparison between perpendicular and angled incidence