

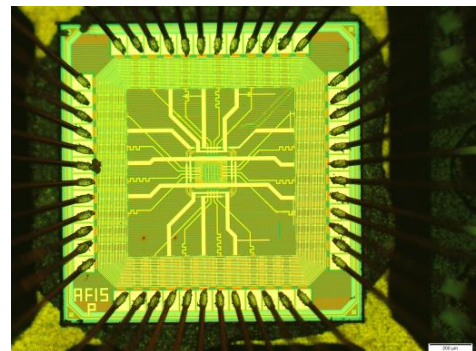
Master's thesis dedicated to semiconductor-based particle detectors for ALICE

Topic

Characterization of an Analogue Pixel Test Structure (APTS) Chip

The AG Ketzer is currently seeking motivated master's students to join our exciting research projects. Our working group is involved in developing the upgrade of the outer tracking system of the ALICE detector which is currently based on a gaseous detector (a time projection chamber, TPC). For the future, we plan to build the outer tracker with silicon-based chips, so-called Monolithic Active Pixel Sensors (MAPS).

For this project, we plan the characterization of an Analogue Pixel Test Structure (APTS) chip. The APTS is a small silicon-based tracking detector with a 4x4 pixel matrix. It is one step in the development process for the final chip. An example of an APTS is depicted in the figure to the right.



The characterization is mainly divided into two sub-projects:

1. Characterization in the laboratories
Goal: Characterize time resolution, energy resolution and noise.
2. Characterization in a testbeam
Goal: Characterize spatial resolution, detection efficiency, in-pixel efficiency.

We are expecting a new version of the APTS at the end of 2025. Since we need quick feedback about the mentioned characteristics, we need a working system by then. A good starting date for a master thesis would therefore be summer 2025.

Possible contents of a master's thesis:

- Build a setup for laboratory measurements
- Plan and conduct testbeams at ELSA and/or at DESY
- Analysis of the recorded data
- Assembly of the APTS modules (glue and bond the chips to carrier cards)

Interested?

Feel free to contact us:

Dr. Philip Hauer hauer@hiskp.uni-bonn.de / Lars Döpper doepper@hiskp.uni-bonn.de

Prof. Ketzer ketzer@hiskp.uni-bonn.de

or show up in person: FTD offices 1.021 or 1.019, Kreuzbergweg 24, 53115 Bonn