

## Laboratory characterization of the H2M MAPS designed in a 65nm CMOS imaging process

The Tangerine project is studying monolithic active pixel sensors (MAPS) that are manufactured using a  $65\text{ nm}$  CMOS imaging process. To investigate this technology and explore the design challenges of porting a hybrid pixel detector architecture into a monolithic chip, the H2M (Hybrid-to-Monolithic) test chip has been developed.

During test beam measurements with H2M, it has been observed that different pulse heights lead to different times of arrival (ToA), meaning that larger signals cross the particle detection threshold faster than smaller signals. This effect is known as time walk. The student will reproduce and study this effect in the lab using the tunable test pulse injection. Additionally, with the same technique, the time-over-threshold (ToT) can be measured. By combining ToA and ToT measurements, the student will investigate and determine a time-walk correction that can be applied to the test beam data. Pixel-to-pixel differences and chip-to-chip differences will be studied. Moreover, the student will join the group for test beam campaigns at DESY II during the summer.

### Group

ATLAS

### Project Category

B2. Development of experimental equipment (hardware-oriented)

### Special Qualifications

Basics in Linux, Python or C++, Unix shell. Nice to have: lab/silicon experience, ROOT basics

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