

11th Beam Telescopes and Test Beams Workshop



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Allpix Squared - A Semiconductor Detector Simulation Framework

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Allpix Squared, a versatile, open-source simulation framework for silicon semiconductor pixel detectors, is now around for more than five years. Since the first release, the framework has developed a lot and the range of users has grown. While originally created for silicon detectors in high-energy physics, it is capable of simulating a wide range of detector types for various application scenarios, e.g. through its interface to Geant4 to describe the interaction of particles with matter, and the different algorithms for charge transport and digitization. This makes it possible to at the same time e.g. simulate a full experimental setup with maximum computation efficiency, and to carry out detailed, time-resolved signal formation studies based on field maps imported from TCAD simulations.

Since the last edition of the BTTB workshop, two feature releases have been released, introducing new modules such as a module simulating charge deposition via a laser beam, but also the possibility to simulate other semiconductor materials than silicon.

At the same time, several new use cases are under development, widening the framework towards simulations of 3D pixel sensors, modelling impact ionisation and more.

This presentation provides an overview over the simulation framework and will highlight the recent developments and the work under development.

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