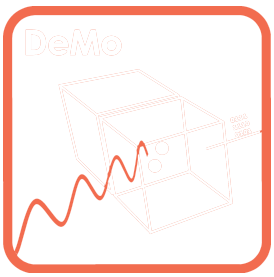

Contribution ID: **11** Type: **Standard Talk**

Allpix Squared - Silicon Detector Monte Carlo Simulations for Particle Physics and Beyond

Wednesday 16 June 2021 14:30 (25 minutes)

Allpix Squared is a versatile, open-source simulation framework for silicon pixel detectors. Its goal is to ease the implementation of detailed simulations for both single sensors and more complex setups with multiple detectors. 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. The simulation chain is arranged with the help of intuitive configuration files and an extensible system of modules, which implement the individual simulation steps. Detailed electric field maps imported from TCAD simulations can be used to precisely model the drift behavior of the charge carriers, bringing a new level of realsim to the Monte Carlo simulation of particle detectors.

Recently, Allpix Squared has seen major improvements to its core framework to take full advantage of multi- and many-core processor architectures for simulating events fully parallel. Furthermore, new physics models such as charge carrier recombination have been introduced, further extending the application range. This contribution provides an overview of the framework and its components, highlighting the versatility and recent developments.

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