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Development of High Spatial Resolution Silicon Based Neutron Detectors for the European Spallation Source

The aim of this project is to bring advanced silicon pixel detector technology to the world of neutron scattering. Such devices would revolutionize the resolution capabilities of detectors by an order of magnitude for detectors up to 1 sq m active area when tiled up. The Project is supported by the Subatomic Group at the University of Bergen (UiB) and SINTEF at Oslo, Norway where facilities and expertise on radiation physics, simulation, instrumentation and readout electronic will be provided. The pixel sensors would be primarily aim for the needs and requirements for the (ESS) European Spallation Source, Sweden. This experimental work would include electrical measurements on sensor level, investigation and understanding of different neutron converter material deposition, electronic and mechanical assembly of these sensors and characterization of sensors using neutron sources. Moreover, data analysis of all experimental data and drawing a physical understanding with the help of GEANT4 simulation will be carried out. In addition, radiation hardness due to the damage of alpha particles and detector's life time will also be studied.

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