Dansk Fysisk Selskab

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ATLAS Detector Upgrade for High Luminosity - Danish Contribution

The LHC will undergo a luminosity upgrade by nearly a factor ten during the 2024-2016 shutdown. For this, the ATLAS detector will undergo substantial upgrades. Most important is the replacement of the complete inner tracker for a new silicon based system. The Niels Bohr Institute contributes to this in three areas: a) In a consortium between NBI and the universities in Lund, Oslo, and Uppsala, we construct and test about 650 (~6 m^2 out of a total of 165 m^2) of silicon senor modules; b) In collaboration with DESY, Hamburg we develop and construct the so-called End-of-Substructure module which is responsible for all communication between the silicon sensor modules and the outside world. Specifically NBI is responsible for the power delivery based on local DC-to-DC conversion; c) For an improved real-time event selection, a Hardware-based Track Trigger (HTT) is being developed. This is based on high-performance Field Programmable Gate Arrays (FPGAs). The talk will describe these contributions and their current status.

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