

The DEPFET based pixel detector at Belle II - construction, performance, and prospects

Tuesday 26 May 2020 14:36 (18 minutes)

The inner 2 layers of the Belle II VXD are based on DEPFETs (PXD). This technology allows the construction of the currently most light-weight pixel detector in operation (0.2% X_0 in the acceptance area). It is the first time that this technology is deployed at a HEP experiment. PXD is in operation in Belle II since 03/2019 and is taking data with very good performance. The S/N is close to 50 and the combined tracking efficiency well above 98% running a peak luminosity of $1e34 / \text{cm}^2\text{s}$ of SuperKEKB. The final goal for the peak luminosity of the machine is $8e35 / \text{cm}^2\text{s}$ and the pixel detector is designed to be operated at the final luminosity up to the accumulated data set of 50 ab^{-1} . The paper will describe the lessons learned during construction, commissioning, and operation of the first DEPFET based vertex detector and will conclude with an outlook to improvements of the DEPFET technology in terms of sensor performance, read-out speed, material budget, and thermal management.

Funding information

Author: ANDRICEK, Ladislav (MPG Semiconductor Lab)

Presenter: ANDRICEK, Ladislav (MPG Semiconductor Lab)

Session Classification: Experiments: Trackers

Track Classification: Experiments: Trackers