

## **Abstract**

This thesis introduces validation and monitoring tools developed and adjusted for the Belle II vertex detector used during the VXD commissioning run in October and November of 2018. The introductory review part introduces the Belle II detector and provides detailed description of the vertex silicon detector, its components and their functions. Subsequently, the software reconstruction methods are introduced and the applied alignment procedure is explained in the third section. The major focus of this thesis is presentation of validation and monitoring results as well as qualitative description of the measurement precision improvement using cosmic muons trajectories reconstructed in the vertex detector. The last part introduces a new tool for estimation of alignment parameters using monitoring and validation methods. The main purpose of this newly proposed method is to provide fast and credible information about the current alignment status to experts using this data.