



2020 HGF – OCPC – Programme

for the involvement of postdocs in bilateral collaboration projects

Title of the project:

Belle II Pixel Vertex Detector

Helmholtz Centre, division/group:

DESY, FH

Project leader:

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Description of the project (max. 1 page):

The vertex detector at the second generation B-factory SuperKEKB/Belle II in Tsukuba, Japan has 4 outer layers of silicon strip detectors (SVD) and two inner pixel layers (PXD). The pixel detector is based on DEPFET technology, which combines signal generation and first amplification in a single device. The technology allows the construction of the currently most light-weight pixel detector in operation. The material is only about 0.2% of a radiation length including all structures needed for support and thermal management. This is only possible with the unique approach of the "all-silicon module" where all read-out ASICs and interconnects are integrated in a micro-machined piece of silicon with the active DEPFET pixel sensor as integral part.

Within a consortium of 12 German institutes and institutes from China, Czech Republic, Poland and Spain, which provide this novel pixel vertex detector to Belle II DESY has a leading role. For the first Belle II physics run, which started in spring 2019 only the inner of the two PXD layers has been installed, which is sufficient for the first years of data taking at a reduced instantaneous luminosity of SuperKEKB.

In parallel to data taking all components for the final two-layer PXD are being prepared in Germany. Before the installation of the new detector in Belle II, which is foreseen in the next long shutdown in 2021/2022, the device has to be extensively tested and characterized in the laboratory which is of utmost importance to reach optimal performance. For this task DESY is looking for an outstanding postdoc with interest in operation and performance optimization of a modern particle physics



detector. Since an important part of the work will have to be done at KEK willingness and eligibility to spend some fraction of his/her time in Japan is required.

Description of existing or sought Chinese collaboration partner institute (max. half page):

The following Chinese institutions are members of the Belle II collaboration:

Beihang, Fudan, IHEP-China, LNNU, NNU, Peking, Shandong, Soochow, USTC

With IHEP-China and Fudan DESY has in the past years already collaborated within the OCPC program.

Required qualification of the post-doc:

- PhD in Experimental Particle Physics
- Experience with modern particle detectors
- Additional skills in modern software and analysis tools
- Strong ability to work independently as well as in a team
- Proof of good command of English language