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Integrated readout electronics for Belle II pixel detector

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Belle II experiment will use a novel type of vertex detector. The detector is based on DEPFET sensor technology which allows construction of 70 micrometer thin sensor modules. A module consists only of silicon components. No mechanical support or cooling structures are needed in the sensor part exposed to particles. DEPFET sensor is operated in rolling shutter mode, with frame period of 20 microseconds and the possibility to electronically enable and disable all pixels within less than one microsecond. Readout components have been designed as integrated circuits. The ICs are connected to DEPFET sensor by bump bonding. Three types of ICs have been developed: SWITCHER for pixel matrix control, DCD for readout and digitizing of sensor signals and DHP for digital data processing. The ICs are radiation tolerant and use several novel features, such as the multiple-input differential amplifiers or the fast and radiation hard high-voltage drivers. SWITCHER and DCD have been developed at University of Heidelberg/KIT and DHP at Bonn University. The IC-development started in 2009 and was accomplished in 2016 with the submission of final designs.
The final ICs for Belle II pixel detector and the related measurement results will be presented in this contribution.

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