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RD53 wafer testing for the ATLAS ITk pixel detector

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RD53 is the research and development group at CERN, responsible for developing and producing the next generation of readout chips for the ATLAS and CMS pixel detector upgrades at the HL-LHC. Its most recent development, ITkPix is the first full-scale 65 nm hybrid pixel-detector.
ITkPix consists of more than one billion transistors with a high triplication ratio in order to cope with the high particle and therefore radiation density at the heart of ATLAS. A failure of chips at the heart of ATLAS is problematic. Therefore, thorough testing before and during the production phase is necessary.
For this purpose, Bonn has developed bdaq, a fast and versatile simulation, testing and analysis environment, making small-and large-scale testing for ITkPix possible. This talk will give an overview over the testing environment, while focusing on large scale wafer testing results to evaluate ITkPix's fitness for its deployment at the HL-LHC.

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