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The TOFHIR2 readout ASIC of the CMS MTD Barrel Timing Layer TAHEREH NIKNEJAD, Laboratory of Instrumentation and Experimental Particle Physics (LIP), Lisbon, Portugal, EDGAR ALBUQUERQUE, RICARDO BUGALHO, VIOREL DUBCEAC, LUIS FERRAMACHO, HUGO FRANÇA, PETsys Electronics, Oeiras, Portugal, MIROSLAW FIRLEJ, TOMASZ FIUTOWSKI, AGH University of Science and Technology, Krakow, Poland, MICHELE GALLINARO, Laboratory of Instrumentation and Experimental Particle Physics (LIP), Lisbon, Portugal, MAREK IDZIK, JAKUB MORON, AGH University of Science and Technology, Krakow, Poland, LUIS OLIVEIRA, DEE, CTS-UNINOVA FCT-UNL, Caparica, Portugal, RUI FRANCISCO, PETsys Electronics, Oeiras, Portugal, JOSE CARLOS SILVA, Laboratory of Instrumentation and Experimental Particle Physics (LIP), Lisbon, Portugal, RUI SILVA, MIGUEL SILVEIRA, PETsys Electronics, Oeiras, Portugal, KRZYSZTOF SWIENTEK, AGH University of Science and Technology, Krakow, Poland, JOAO VARELA, PETsys Electronics, Oeiras, Portugal, TOFHIR TEAM TEAM — The CMS Detector will be upgraded for the HL-LHC to include a MIP Timing Detector (MTD). The MTD will consist of barrel and endcap timing layers, BTL and ETL, respectively, providing precision timing of charged particles. The BTL sensors are based on LYSO:Ce scintillating crystals coupled to SiPMs with TOFHIR2 ASICs for the front-end readout. A resolution of 30-40 ps for MIP signals at a rate of 2.5 Mhit/s per channel is expected at the beginning of HL-LHC operation. We present an overview of the TOFHIR2 requirements and design, simulation results, and the first measurements with silicon samples.

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