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## Gotthard-II: A ultra-fast Silicon Microstrip Detector with on Chip digital Image Memory

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Gotthard-II is a microstrip detector developed for XFEL.EU. The applications include but are not limited to: energy dispersive experiments at 4.5 MHz frame rate, and veto signal generation. In Gotthard-II a silicon microstrip sensor with a pitch of 50  $\mu\text{m}$  or 25  $\mu\text{m}$  is wire-bonded to the readout ASICs. The ASIC is implemented with adaptive gain pre-amplifiers (PA), Correlated-Double-Sampling (CDS) amplifiers, 12-bit 20MS/s Analog-to-Digital Converters (ADC) and Static Random-Access Memory (SRAM) for storing all 2700 images in an XFEL bunch train.

Several prototype designs of the analogue front-end (PA + CDS) and ADC have been fabricated in UMC 110nm CMOS technology. The last prototype, which was submitted in March 2017, consists of a full signal chain: 8 front-end channels + 2 ADCs + 1 SRAM. The mask layout of this prototype is shown in Fig. 4. The chip was back from the foundry in July 2017. The measurement results for these prototypes will be presented and the key issues which have to be solved in the final chip will be discussed in the conference.

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