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TEMPUS: a Timepix4-based readout system for photon science

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A readout system for the Timepix4 timestamping pixel ASIC, TEMPUS, is being developed for photon science experiments. Compared to current systems, this will have higher time resolution (in the ns regime for silicon sensors and X-ray applications) and much higher event rate capability (around Mhit/mm2/s), requiring development of high-data-rate board designs and firmware. Moreover, when working in the photon counting mode, higher frame rates than currently available systems will be achievable (40kfps). The first image from a single chip has been obtained using a radioactive source. Also multi-chip modules are under development with the idea of covering large areas while reducing gaps between sensors. In this context, TSV technology (fully supported by the ASIC) is expected to be used.

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