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## **The DAQ system for the HEPD-02 tracker: a clock-on-demand approach for using Monolithic Active Pixel Sensors in space**

To adopt monolithic active pixel sensors for space-based applications requires to lower their power consumption and to optimize the heat dissipation, to fulfill the constraints imposed by satellite power and cooling capacity. MAPS will be used for the first time in space within the High Energy Particle Detector, onboard the CSES-02 satellite. Space-register requirements are met with a parallel sparsified readout architecture, implemented on a single low-power FPGA chip, which manages 150 ALPIDE sensors [1], arranged on three sensitive planes. Two devices mainly contribute to reduce the average power consumption, i.e. using the control line instead of the high speed data link to readout the ALPIDE sensors and locally distributing the clock only to when the detector is crossed by a particle. The last concept is scalable to larger and more complex detectors and represents an important step towards the future of particle trackers in space.

[1] NIMA, Volume 824, 11 July 2016, Pages 434-438

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