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New Results from Timepix4 at the SPS

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A double arm beam telescope was built with Timepix4v2 ASICs to test the performance of the new ASIC' s synchronous readout and track reconstruction capabilities, as well as its temporal performance. The new telescope is composed of eight planes with n-on-p silicon sensors. Four of these planes are instrumented with 300 µm thick sensors tilted with respect to the beam, to provide high quality spatial measurements, while the remaining four have 100 µm thick sensors to achieve a better timing response. In between the two arms a DUT can be placed. Each detector assembly (sensor plus Timepix4 ASIC) is readout with a SPIDR4 system developed by Nikhef and ASI. They are cooled by a 3D printed titanium blocks directly attached to the test PCB, through which a cooling fluid is circulated. The cooling block has a circular cut-out to minimise the amount of material traversed by incident particles. A PicoTDC in combination with a MCP is employed in order to provide a precise time reference for low rate applications, while three scintillators are employed to provide an initial time reference for high rate applications and to probe the temporal performance of the individual telescope planes. In this presentation, the initial results of the timing and spatial resolution of this telescope will be shown and the dependency on the operating conditions of the telescope such as the threshold level and bias voltage are discussed. Furthermore, the steps towards the next iteration of the telescope planned for this year will be shown.

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