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#02-23 Ultra Fast timing detectors with applications in cosmic ray physics, medical science and other domains

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We were developing a cheap concept of a fast commercial silicon pixel detectors combined with a state of the art readout electronics based on ultrafast sampling and waveform digitizers of the signal giving simultaneously its time and amplitude.
This concept was used originally in High Energy Physiscs and we transpose it
with two applications from cosmic ray physics and particle therapy medicine.
For the astrophysics program, the principle is to perform direct particle identification and energy measurement using a few layers of cheap detectors that will be sent to space in collaboration with NASA. We will discuss the performance of our detectors as well as the results from simulation before launch in few months.
For the medical application in particle therapy, the principle is to measure with high accuracy the beam dose delivery during proton beam treatment individual bunch by bunch to know with high accuracy especially for flash high intensity beam treatment. Results performed at the hospital of Dublin, Ireland, will be presented.

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