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The Gigatracker of the NA62 experiment at CERN

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NA62 is a fixed-target experiment at the CERN SPS designed to measure the branching ratio of the very rare kaon decay $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ with 10% precision. Measurements of time, momentum and direction of incoming beam particles are provided by a beam spectrometer called GigaTrackKer.

The GigaTrackKer is made of three stations of hybrid silicon pixel detector installed in vacuum (~ 10 -6mbar). Each station consists of 18000 pixels of $300 \times 300 \mu\text{m}^2$ area each, arranged in a matrix of 200×90 elements corresponding to a total area of $62.8 \times 27 \text{mm}^2$. The beam particles, flowing at 750 MHz, are tracked in 4-dimensions by means of time-stamping pixels with the single hit time resolution reaching 115ps. This performance has to be maintained despite the beam irradiation amounting to a yearly fluence of $4.5 \times 10^{14} \text{ 1MeV } n_{eq}/\text{cm}^2/200 \text{ days}$. In order to limit multiple scattering and beam hadronic interactions, the station material budget is reduced to 0.5%X0 by using micro channel cooling (first application in HEP).

We will present the detector design and performances during the NA62 data taking periods.

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