



Contribution ID: 11

Type: **Invited Talk**

4th dimensional tracking: the GigaTracker of NA62 experiment.

Thursday 14 September 2017 09:00 (25 minutes)

The GigaTracker is a lightweight hybrid silicon pixel detector built for the NA62 experiment at CERN, which aims at measuring the branching fraction of the ultra-rare kaon decay $K^+ \rightarrow \pi^+ \nu \bar{\nu}$ at the CERN SPS. The detector consists of three stations, $61 \times 27 \text{ mm}^2$ each, which tracks particles in a $75 \text{ GeV}/c$ hadron beam with a flux reaching

$1.3 \text{ MHz}/\text{mm}^2$ and provides single-hit timing with 130 ps resolution.

Each station is composed of a $200 \mu\text{m}$ thick planar silicon sensor,

segmented in $300 \times 300 \mu\text{m}^2$ pixels, bump-bonded to 2×5 custom $100 \mu\text{m}$ thick ASIC, called TDCpix.

Each TDCpix contains 40×45 asynchronous pixels, and is instrumented with 720 time-to-digital converter channels with 100 ps bin.

The three stations are installed in vacuum (about 10^{-6} mbar) and cooled with liquid C_6F_{14} circulating through micro-channels etched inside few hundred of micrometers thick silicon plates.

The total material budget is less than $0.5\% X_0$ per station.

Detector description, operational experience and performance from the NA62 experimental run in 2016, at about 30% the nominal beam intensity, will be presented.

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Session Classification: 4th dimensional tracking and vertexing (timing)