

# GEMPIX

A device able to detect all types of radiation with a high spacial resolution

The GEMPix detector combines existing CERN-developed technologies - GEM (Gas Electron Multiplier), a type of gaseous ionisation detector and Medipix, a family of photon-counting pixel detectors. In combination, the features of each technology are enhanced and the resultant technology is a hybrid device able to detect all types of radiation with a high spatial resolution.

The purpose of the technology is to measure and visualise the low-energy deposits in gas or tissue-equivalent samples. Due to the wide gain range of the chamber, the new device could also be used to measure particle beam structure (i.e. protons and carbon ions) in hadron therapy with good spatial resolution. It may be used also for X-ray monitoring in burning plasma physics.

## AREA OF EXPERTISE

- Detectors

## IP STATUS

- Industrial Secret

## TECHNOLOGY READINESS LEVEL

- System test and operation

## CONTACT

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Find out more at:

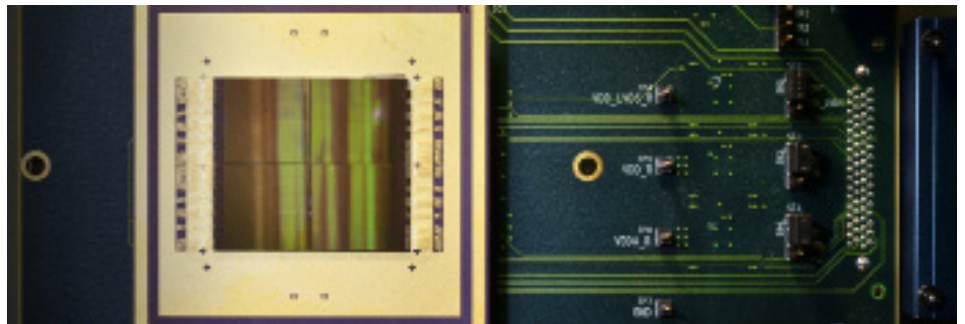
[kt.cern](http://kt.cern)

## FEATURES

- Use of triple-GEM technology allows a wide-gain range in particle detection.
- Use of Timepix, an advanced version of Medipix, allows 3D reconstruction of the particle track and particle identification.

## APPLICATIONS

- Dosimetry, microdosimetry and sub-microdosimetry.
- Radiobiology; analysis of biological effects of radiation on tissue samples.
- Conventional radiation therapy and hadron therapy.
- Measurements of low-energy photons in radioactive waste monitoring.
- 2D beam imaging in radiation therapy.
- 3D energy deposition reconstruction in hadron therapy.
- X-ray monitoring in burning plasma physics.



technology

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Accelerating Innovation