

# MPS Radiation Monitoring

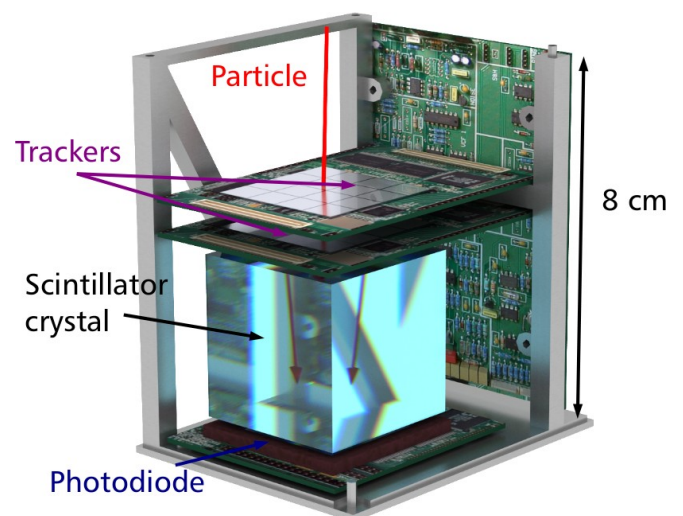
The Multifunctional Particle Spectrometer (MPS) is an energetic particle spectrometer and a general purpose radiation monitor. The MPS provides identification of electrons, protons, ions and gammas by the  $\Delta E$  versus  $E$  method. The instrument provides energy and angular reconstruction of all incoming particles in a large continuous energy range, allowing it to reconstruct the radiation environment in detail.

The MPS consists of a two-layer silicon pixel tracker and a scintillation crystal that is optically connected to a photodiode. The readout chain is based on an FPGA that performs digital filtering and can do the particle identification in real time at high count rates. The MPS utilizes the latest developments in scintillator and FPGA technology.

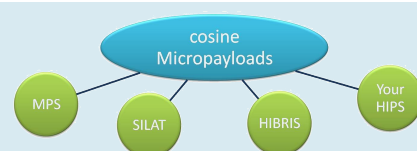
The performance of the MPS can be adapted to the client's requirements. It can be used as an advanced radiation monitor for space, including nano- and microsatellites, for security, material analysis, medical and scientific applications.

Parameter	Value
Recognized particles	$\gamma$ , e, p, $^3\text{He}$ , $^4\text{He}$ , C, N, O, Ne
Energy range	$\gamma$ rays: 0.1 to 3 MeV electrons: 1 to 20 MeV protons: 1 to 200 MeV alphas: 5 to 400 MeV
Energy resolution	$\gamma$ rays : 10% electrons: 20% protons and alphas: < 5%
Aperture	45°
Angular resolution	<10°
Max. particle count rate	10 MHz
Max. particle identification rate	100 kHz
Mass	700 g
Power	1.5 W
Size	80x70x70 mm <sup>3</sup>

With the elegant instrument concept and fast algorithms running on FPGA cores, the MPS offers better performance using less resources than existing radiation monitors.



For more information about this product please contact Dr Erik Maddox, e.maddox@cosine.nl, +31 71 5284962



## MPS Applications

### Beam line monitoring

- Monitoring and analysis of electron, proton, ion, and neutron beams at accelerator facilities

### Space and aerospace radiation monitoring

- On board radiation monitoring and dosimetry for protection of sensitive instruments and crews
- Measurement of scientific data for space environment and space weather research

### Radiation safety

- Dosimetry for personnel in hospitals, emergency services, nuclear industry and military
- Calibration of radioactive sources
- Isotope identification for border control and anti proliferation

### Nuclear Industry

- Combined neutron and gamma monitoring for nuclear reactors (fusion and fission)
- Nuclear waste monitoring

### Material analysis

- Isotope analysis for mining and geology
- Non destructive material analysis
- X- and gamma-ray imaging

