

## MCP based detectors, calibration, acceptance tests and first photon radiation measurements.

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### **Abstract**

Detectors based on micro channel plates (MCP) are used to detect the radiation of free electron lasers. Three MCP detectors were developed by JINR for the European XFEL (SASE1, SASE2, and SASE3 beamlines). These detectors were designed to operate in a wide dynamic range from the level of spontaneous emission to the SASE saturation level (between a few nJ and up to 25 mJ), and in a wide wavelength range from 0.05 nm to 0.4 nm for SASE1 and SASE2, and from 0.4 nm to 4.43 nm for SASE3. The photon pulse energies are measured by an MCP with anode and with a photodiode. The photon beam image is observed by an MCP imager with a phosphor screen anode.

Three different tasks can be performed with the EuXFEL MCP-based photon detectors:

- 1) study of the initial stage of the SASE regime;
- 2) measurement of the photon pulse energy;
- 3) measurement of the photon beam image.

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