

The Residual Gas Ionization Profile Monitor in the J-PARC 3-GeV Rapid Cycling Synchrotron

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The residual gas Ionization Profile Monitor (IPM) is developed in the J-PARC 3-GeV RCS. The IPM is a monitor to observe a circulating transverse beam profile in the ring, and consists of the electrodes for external electric fields, the wiggler magnets for external magnetic fields, the Micro Channel Plates (MCPs) for detection of produced ions and electrons, and the Electron Generator Array (EGA) for calibration of the MCP gain. The IPM system is shown in Fig. 1. The positively-charged ions or negatively-charged electrons produced by the beam passing through the residual gas in the beam chamber lead to the MCP by the external electric field and the projected beam profile is observed from the MCP signals. The external electric fields with high uniformity are required to project the beam profile. There are two operation modes, which are ion and electron collection mode. At present, the ion collection mode is mainly used at the beam commissioning. However, the electron collection mode with magnetic field is needed in the high intensity beam operation from the view point of a high space charge force.

The detail IPM system will be introduced and latest results in beam commissioning will be reported in this presentation.

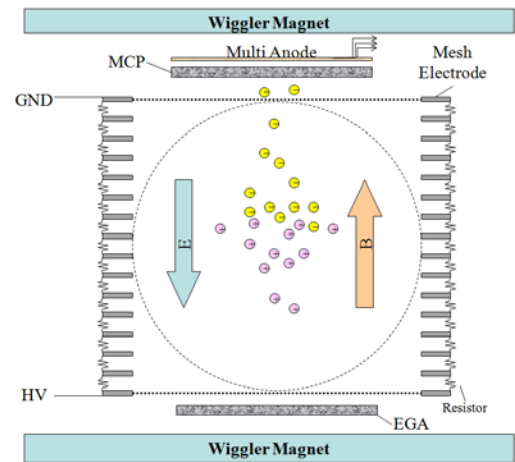


Fig. 1 Schematic drawing of the IPM. This shows the electron collection mode with external electric (E) and magnetic field (B).