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Development for 3-D spiral injection scheme by use of electron gun

Three dimensional beam injection is an one of major technical challenges for new muon $g-2$ /EDM experiment at J-PARC. In order to validate a basic concept of this injection scheme, we have developed a compact beam line which includes electron gun and solenoid magnet for storage 80 keV electron beam. Although, entire beam line length is 2m only, we have three rotating quadrupole magnets to apply "X-Y coupling" to the beam. X-Y coupling is the key of 3-D spiral injection scheme. In this report, we introduce an outline of this beam line, as well as beam diagnostic systems. Visualized the 3-D trajectory in the storage chamber, which is an ionized light emission in nitrogen, is also discussed. Finally, we discuss how to control X-Y coupling by use of three rotating quadrupole magnets.

Session

Poster Session

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