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Investigation of read-out methods for electro-optical beam position monitor pickups

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Electro-Optical pickups are being explored at CERN to develop a high-bandwidth beam position monitor capable of measuring the intrabunch beam position. To explore this a prototype Electro-Optical beam position monitor system has been installed into the SPS. The investigations in the SPS use a fibre coupled laser connected into Lithium Niobate crystals. The beam field passing the crystal induces a proportional phase shift in the laser by changing the refractive index of the crystal. Readout is typically performed by placing a crystal either side of the beam in a Mach-Zehnder interferometric setup. This setup currently suffers from imperfect pickup matching and limitations in dynamic range. Using a benchtop laser and replica pickups this paper examines and reviews different methods and techniques that could be employed to read out the beam position produced from the phase shifted laser and mitigate these issues.

Footnotes

Paper preparation format

LaTeX

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Europe

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