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A positron beamline for channeling experiments at MAMI

Wednesday 4 June 2025 16:00 (2 hours)

The Institute for Nuclear Physics of the University of Mainz operates the accelerator complex MAMI. Outstanding qualities are the continuous beam with an excellent beam quality, a very low energy spread, as well as its extremely high reliability. All kinds of channeling experiments require such a high quality beam with a low divergence. Positrons, however, are more preferable because they have a significant longer de-channeling length. The aim the project is the preparation of high-quality positron beam using the features of the MAMI accelerator.
Positrons will be created by pair conversion of bremsstrahlung, produced by a focused 855 MeV electron beam of MAMI in a 10 um thick tungsten converter target, and energy selected by an outside open electron beamline bending magnet. A sector magnet bents back the beam. Magnetic focusing elements in between are designed to prepare in a well shielded chamber about 6 m away from the converter target a low divergence positron beam.
The features of the positron beam line such as the positron rate, the beam spot size and the divergence of the positron beam will be discussed. First channeling experiments with Silicon crystals will be presented.

Footnotes

Paper preparation format

LaTeX

Region represented

Europe

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