

Contribution submission to the conference SMuK 2023

Compton transmission polarimetry of LPA-accelerated electron beams — •JENNIFER POPP^{1,2}, SIMON BOHLEN¹, LOUIS HELARY¹, FELIX STEHR^{1,2}, GUDRID MOORTGAT-PICK^{2,1}, JENNY LIST¹, JENS OSTERHOFF¹, and KRISTJAN PÖDER¹ — ¹Deutsches Elektronen-Synchrotron DESY, Hamburg — ²Universität Hamburg

For the study of spin-dependent processes polarised particle beams are indispensable. The LEAP (Laser Electron Acceleration with Polarisation) project at DESY aims to demonstrate the production of polarised electron beams exploiting the extremely high acceleration gradients of laser plasma accelerators. In this proof of principle experiment, spin-polarised electron beams with energies of tens of MeV will be generated in a sub-millimetre long plasma source. For electron beams of such energies, Compton transmission polarimetry is the ideal method to measure the polarisation. Gamma rays produced by bremsstrahlung are transmitted through a magnetised iron absorber core depending on their polarisation direction and that of the electrons in the iron. The resulting transmission asymmetry is proportional to the initial electron polarisation. In this talk, an overview of the LEAP project will be given and a polarimeter design, as well as its implementation and commissioning status will be presented.

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Topic: Diagnostics, Control and Instrumentation
Email: jennifer.popp@desy.de