Commissioning of a 2D Si(Li) Compton polarimeter

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The study of particle and photon polarization phenomena occurring in the interaction of fast ion and electron beams with matter is of particular relevance for the understanding of cosmic and laboratory plasmas where high temperatures, high atomic charge-states and high field strengths prevail. In addition, polarizationsensitive studies of radiative processes in highly-charged, heavy ions may provide detailed insights in both relativistic particle dynamics as well as QED effects and other atomic structure properties at extreme electromagnetic field strengths. Moreover, x-ray polarimetry was proposed as a tool for diagnosis of spin-polarized ion beams. Owing to the recent progress in x-ray detector technology, accurate measurements of the linear polarization for hard x-ray photons as well as the determination of the polarization orientation have become possible.

To strengthen the instrumentation portfolio in line with the scientific program of the SPARC pillar of FAIR a novel Si(Li)-Compton polarimeter was build and recently commissioned in a test experiment at the ESR storagering of the GSI accelerator facility. I will present a preliminary analysis of the data obtained with the new instrument.

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