



Contribution ID: 59

Type: **Parallel Contribution**

Hard x-ray polarimetry applied to stored high-Z ions

Tuesday, 11 October 2011 09:50 (25 minutes)

Studies of the polarization of hard x-rays emitted in energetic heavy-ion atom collisions provide detailed information of the collision dynamics as well as of the atomic structure at high-Z [1]. Moreover, hard x-ray polarimetry also opens a route for polarization diagnosis of spin-polarized ion and electron beams as are discussed for future PNC experiments [2,3]. However, due to the lack of efficient polarimeters previous studies of the radiation stemming from highly-charged ions were mainly restricted to measurements of the spectral and angular distribution. Owing to recent progress in the development of highly segmented solid-state detectors, a novel type of Compton polarimeter for the hard x-ray regime has become available [4]. We present a position sensitive Si(Li) detector that was developed within the SPARC collaboration as a dedicated Compton polarimeter for the energy region between 70 and a few 100 keV [5]. First measurements indicate that this instrument now allows precise and efficient measurements of photon linear polarization properties in various experimental environments [6,7,8]. Results from recent polarization studies performed at the ESR storage ring at GSI [7] and at the polarized electron source SPIN at the TU Darmstadt [8] will be presented.

[1] Th. Stöhlker et al., Eur. Phys. J.-Spec. Top. 169, 5 (2009)

[2] A. Surzhykov et al., Phys. Rev. Lett. 94, 203202 (2005)

[3] A. Bondarevskaya et al., J. Phys. B 43, 245001 (2010)

[4] U. Spillmann et al., Rev. Sci. Instrum. 79, 083101 (2008)

[5] G. Weber et al., JINST 5, C07010 (2010)

[6] S. Hess et al., J. Phys. Conf. Proc. 195, 012025 (2009)

[7] G. Weber et al., Phys. Rev. Lett. 105, 243002 (2010)

[8] R. Märtin et al., AIP Conf. Proc. 1336, 94 (2011)

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Session Classification: Nuclear Physics II

Track Classification: Nuclear Physics