Effect of the magnetic field on photoemission apparatus at BL-1

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Extreme ultraviolet spectroscopy beamline, BL-1 [1] provides photons between ~5 eV to ~50 eV. Probing depth of valence band photoemission is expected to vary between a few Å to roughly 15 Å in this photon energy range [2]. Photoemission experimental station equipped with Phoibos 100, SPECS has been installed at BL-1. We report on the effect of the magnetic field created by the storage ring.

Figure 1 shows the measured magnetic field as a function of the distance from the light source. The sample position of the photoemission station is located at the 6.2-m point and the photoelectron analyzer is at the 5.7-m point. Therefore the magnetic field outside of the photoemission station is roughly 6 G. Although the sample chamber is a mu-metal chamber magnetic field enters the chamber through several open ports. Measured magnetic field at the sample position was 90 mG. Effect of the magnetic field has been first tested with Au 4f photoemission by means of Al K-α X-ray. The measured photoelectron count rate was about 7 times smaller when the storage ring was running than when it was not.

Shielding of magnetic field through larger ports of the system is expected to be efficient. In addition, the magnetic field around the sample position may be cancelled out by means of electromagnetic coils attached on view ports. Although these are expected to contribute to a certain extent, it might be necessary to move the apparatus to a position farther from the light source.

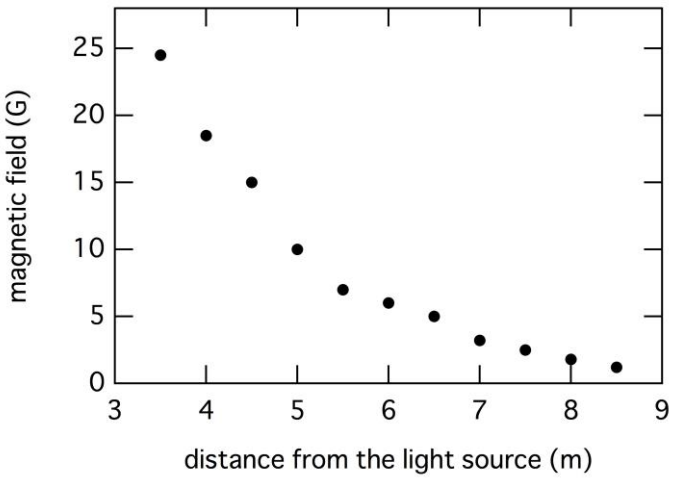

Fig. 1. Magnetic field from the storage ring as a function of the distance from the light source measured at BL-1.

References

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