MAGNETISM OF ULTRA-THIN IRON FILMS SEEN BY THE NUCLEAR RESONANT SCATTERING OF SYNCHROTRON RADIATION

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9.7 cm

Conversion electron Möussbauer spectroscopy proved in the past to be very useful in studying surface and ultrathin film magnetism with monolayer resolution. Twenty years later, its time-domain analogue, the nuclear resonant scattering (NRS) of synchrotron radiation, showed up to be by orders of magnitude faster and more efficient. It will be shown how the isotopic sensitivity of NRS, combined with the ^{57}Fe probe layer concept, was explored to study influence of the interlayer exchange coupling to FeAu monoatomic superlattices on the magnetic properties of the iron monolayer on Au(001). In the second example, combination of UHV conditions and the high brilliance of the third generation synchrotron source is used to probe the evolution of spin structure in epitaxial Fe films on W(110) via the accumulation of high quality time spectra directly during the ^{57}Fe film growth. In this way the scenario of the in-plane spin reorientation transition (SRT) occurring for Fe/W(110) system could be followed. The analysis of NRS data clearly shows that the SRT consists in the formation of the unexpected, non-collinear magnetic structure which mimics the planar domain wall.

13.4 cm

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