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Planar domain wall in antiferromagnetic/ferromagnetic systems: the Co/NiO case

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The exchange bias effect established at the interface between antiferromagnetic and ferromagnetic materials holds a key role in today's magnetoelectronic devices. Models describing this phenomenon rely on the creation of a planar domain wall at the FM/AF interface when the ferromagnet magnetization is rotated. However, measurements of interface and antiferromagnetic properties have been a big challenge up to now. In this context we have been able to confirm for the first time experimentally the presence of a such domain wall at the interface of Co/NiO systems by means of X-ray magnetic linear dichroism. Different Co/NiO samples have been studied as a function of the NiO structure (single crystal, thick film and polycrystalline), temperature and magnetic treatments. The existence or not of a planar domain wall is discussed.

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