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Exchange bias training effect in Co/CoO heterostructures with variation of the ferromagnetic film thickness¹ SRINIVAS POLISETTY, TATHAGATA MUKHERJEE, SARBESWAR SAHOO, CHRISTIAN BINEK, University of Nebraska-Lincoln — The exchange bias (EB) training effect is studied in a Co/CoO heterostructure using low temperature longitudinal Kerr rotation. After field cooling the sample to below the Néel temperature of CoO the EB training effect manifests itself by a decrease of the EB field upon cycling the Co film through consecutive hysteresis loops. We explore the temperature dependence of the training effect and its dependence on the Co-thickness, t_{Co} . The latter is studied by locally probing the EB in a wedge Co/CoO system. The gradient of the Co film thickness allows to measure local t_{Co} -dependences in a range of $\Delta t_{Co} = 23.6\text{nm}$ varying over the substrate length of 8.5mm. The Co wedge is prepared by MBE taking advantage of the steep decrease of the Co flux when leaving the center of the Co beam. A wedge angle of 1.6×10^{-4} ° is revealed by local small angle X-ray reflectivity. We compare the measured t_{Co} -dependence with our phenomenological theory predicting a t_{Co}^2 -increase of the leading fitting parameter. This behavior is clearly distinguishable from the $1/t_{Co}$ -decrease of the equilibrium EB field.

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Christian Binek
University of Nebraska-Lincoln

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