# XMCDPEEM studies of the virgin and remanent domain structure of submicron magnetic patterns

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Magnetic storage and sensing devices use now patterns in the submicron range. For the understanding of the switching behavior of these patterns it is important to have some information on the energy landscape of their domain structures. This can be obtained by a comparison of micromagnetic simulations with the frequency with which the various virgin domain patterns appear in these patterns. For information storage it is important how reproducible the domain structure in the remanent state is.

This talk summarizes the results of the studies of virgin and remanent domain structures using X-ray magnetic circular dichroism PEEM (XMCDPEEM), which we have done over the past several years. A number of patterns of current interest have been studied: rings, ring segments and rectangles, as a function of film thickness and dimensions, mostly in Co films but also in permalloy films. The rectangular patterns are compared in detail with micromagnetic simulations.

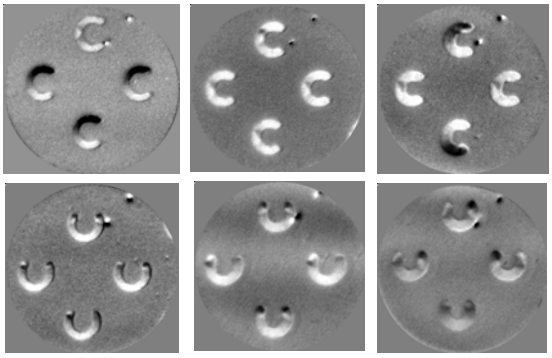

Fig.1. Remanent states of 1 micron O.D.Co horseshoe patterns with 150, 200 and 300 nm various orientations in the applied field

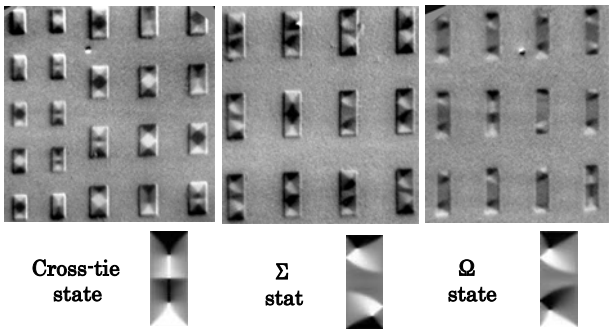


Fig.2. Virgin states of 30 nm thick, 400 and 600 nm wide Co width and rectangles with aspect ratios 2:1, 3:1 and 4:1