

Direct observation of meta-stable magnetization states in Fe/W(110) nanostructures

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Aberration corrected Spin Polarized Low Energy Electron Microscopy (AC-SPLEEM) has been commissioned, with a spatial resolution of ~ 3.3 nm in spin asymmetry images[1]. The high spatial resolution will provide more details to reveal the magnetic structure of ferromagnetic surfaces on the atomic depth scale level [1-2], for example, to probe the low dimensional nanoscale topological magnetization structures in great details including vortices and skyrmions. Here we report the direct observation of a meta-stable Omega state with double vortices of the same circularity in nanoscale Fe island on a W(110) substrate. The process indicates that this metastable state is formed by two isolated islands merging during annealing, while keeping their original magnetic state. The result is further confirmed by micromagnetic simulations.

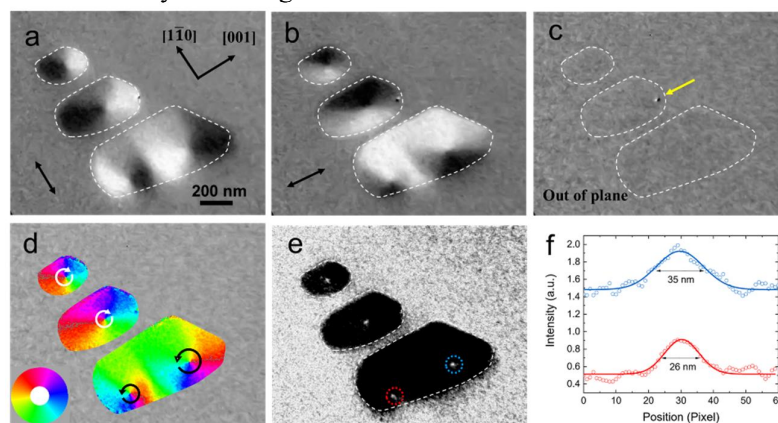


Figure 1. Vector mapping of magnetic structure of different Fe islands on W(110).

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