

## Dynamic stabilization of nonequilibrium domain configurations in magnetic squares

*Thursday, 19 September 2013 12:30 (2 hours)*

We explore the linear and nonlinear dynamic regimes of micrometer-scale Ni<sub>81</sub>Fe<sub>19</sub> squares. The response of the magnetisation under a continuous sinusoidal excitation is monitored by time-resolved scanning transmission x-ray microscopy. Non-equilibrium domain configurations are dynamically stabilized under increasing amplitude of the excitation field. On reducing this amplitude, the magnetisation returns to the equilibrium configuration. We have spatially resolved the transition between two stable magnetic configurations and present complementary micromagnetic simulations alongside the experimental data, which provide insight into the energy dissipation and spin wave contributions. Spin wave instabilities, which arise in the non-linear regime and play a role in the generation of non-equilibrium modes can ultimately lead to vortex core reversal.

**Primary author:** Ms STEVENSON, Stephanie (Paul Scherrer Institut)

**Co-authors:** MOUTAFIS, Christoforos (Paul Scherrer Institut); Dr QUITMANN, Christoph (Paul Scherrer Institut); Mr HELDT, Georg (Paul Scherrer Institut); Dr RAABE, Jörg (PSI); Dr HEYDERMAN, Laura (Paul Scherrer Institute); Mr WOHLHÜTER, Phillip (Paul Scherrer Institut); Dr CHOPDEKAR, Rajesh Vilas (Paul Scherrer Institut)

**Presenter:** Ms STEVENSON, Stephanie (Paul Scherrer Institut)

**Session Classification:** Poster session II and lunch