Supporting Information for

A Tuneable Magnetic Domain Wall Conduit Regulating Nanoparticle Diffusion

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Supporting video files

With the article there are 4 videoclips as support of Figures and Main text.

VideoS1(.AVI): This videoclip shows the trapping of 360nm paramagnetic colloids deposited above a magnetic domain of ferrite garnet film (FGF) in absence of external field and polymer coating. The particles are trapped at the Bloch walls (BWs), the transition regions bridging two magnetic stripe domains. the particles display negligible thermal fluctuations due to the strong trapping force exerted by the BWs.

VideoS2(.AVI): Two videoclips illustrates the dynamics of 360nm paramagnetic colloids deposited above an FGF film coated with a 1.2 μm thick layer of a photoresist. The top video illustrates the dynamics in absence of applied field, while the bottom videos shows the situation where an external magnetic field of amplitude H_z= 620 A/m is applied perpendicular to the FGF film. In the first case the particles can diffuse in the perpendicular direction, while in the second case are trapped along the stripe domains. The corresponding process is illustrated in Fig.2b and 2d of the article.

VideoS3(.AVI): This videoclip shows the formation of a single file of 360nm paramagnetic colloids trapped on the stripe domains of a FGF film and subjected to an external magnetic field of amplitude H_z= 1240 A/m applied perpendicular to the FGF film. The corresponding process is described in Fig.4 the article.

VideoS4(.AVI): This videoclip shows the periodic condensation of 270nm paramagnetic colloids above a stripe patterned FGF film subjected to an external oscillating magnetic field applied perpendicular to the FGF plane. The applied field has frequency $f = 1$ Hz and amplitude $H_z = 1370$ A/m. The corresponding process is described in Fig.5 the article.