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Domain wall remote pinning in magnetic nano wires DAN READ, Cardiff University, JORGE MIGUEL, FRANCESCO MACCHEROZZI, STUART CAVILL, SARNJEET DHESI, Diamond Light Source, CARDIFF UNIVERSITY COLLABORATION, DIAMOND LIGHT SOURCE COLLABORATION — In the current race for information storage media with ever increasing density the position of magnetic domain walls, the region in a magnetic system where the local magnetization continually rotates its direction between adjacent magnetic domains, is one of the most promising routes for future storage media devices. Information storage requires ultrafast read-out and writing operations, but domain walls need to be pinned so that the information is safely stored in the long term. Here we investigate the use of remote magnetostatic charges to trap domain walls. By using X-ray photoelectron emission microscopy we have followed the position of domain walls of opposite charge being pinned or repelled by pinning potentials of increasing strength. Micromagnetic simulations show an excellent agreement with the experimental results. We demonstrate the attractive or repulsive character of the interaction between domain wall and trap depending upon the sign of their magnetic charges. These quasi-static experiments are the antecedent to ultrafast time-resolved XMCD-PEEM experiments where the spin-transfer torque effect will be studied dynamically by applying picosecond-long current pulses across the magnetic nanowire.

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