

Movie Captions

S1. 4D Lorentz electron microscopy of Ni/Ti films (30nm/30nm) on Formvar: Time dependent change of magnetic domain walls. After the arrival of a clocking pulse (fluence = 6.4 mJ/cm^2) at $t = 0$, oscillatory nucleation and annihilation of zigzag domain walls is observed. The area of the image is $27 \text{ }\mu\text{m} \times 27 \text{ }\mu\text{m}$ and the full time range is 87 ns. The time scale of the dynamics has been slowed down by a factor of 80 million.

S2. Mechanical motion of Ni/Ti nanostructures. In-focus time scan (magnification: 3,600 \times) of an FIB-fabricated pinning structure of Ni/Ti on Formvar. Excitation fluence was 6.4 mJ/cm^2 . The movie covers a time range of 295 ns, and the time scale has been slowed down by a factor of 50 million.

S3. Domain wall (DW) propagation for Ni/Ti thin film on Si_3N_4 substrate (fluence = 8.5 mJ/cm^2). DW waves radiate out from the island at top left and propagation of a DW wave train is most distinctly seen in the vicinity of the dashed circle. The 295 ns time range of the dynamics has been slowed down by a factor of 25 million in the movie.