

Dynamics of magnetic domain wall motion after nucleation: Dependence on the wall energy

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The dynamics of magnetic domain wall motion in an FeNi layer magnetically coupled to a Co layer across an insulating spacer layer (a magnetic tunnel junction-like trilayer) has been investigated by a combination of x-ray magnetic circular dichroism, photoelectron emission microscopy, and a stroboscopic pump-probe technique, which allows layer-, lateral-, and time-resolved measurements [1,2]. The nucleation of domains and the subsequent domain wall motion in the FeNi layer from the viscous regime up to the Walker limit field were observed during nanosecond-long magnetic field pulses. A delay of domain expansion, depending on the amplitude of the field pulses, was observed. This delay can be fully understood by taking into account the domain wall energy that acts against the domain expansion and plays an important role while the domains are small [3].

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