

Control of domain wall motion by interference of spin wave

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We propose a method to control the motions of magnetic domain walls using the interference phenomenon of the spin wave [1]. Through micromagnetic simulations, it is found that when the distances between two neighboring walls are integer multiples of half wavelengths of the spin wave, the transmission coefficients of the spin wave are local maxima. This interference effect provides a new method for controlling the spin-wave induced domain-wall motion, not only the speed of the domain wall motion but also its moving direction. In addition, tuning the distance of walls, we can find the direct relationship between the domain-wall velocity and the transmission coefficient, a crucial parameter of the spin-wave-induced domain-wall motions.

Reference

- [1] K.-W. Moon, B. S. Chun, W. Kim, and C. Hwang, *J. Appl. Phys.* **114**, 123908 (2013).

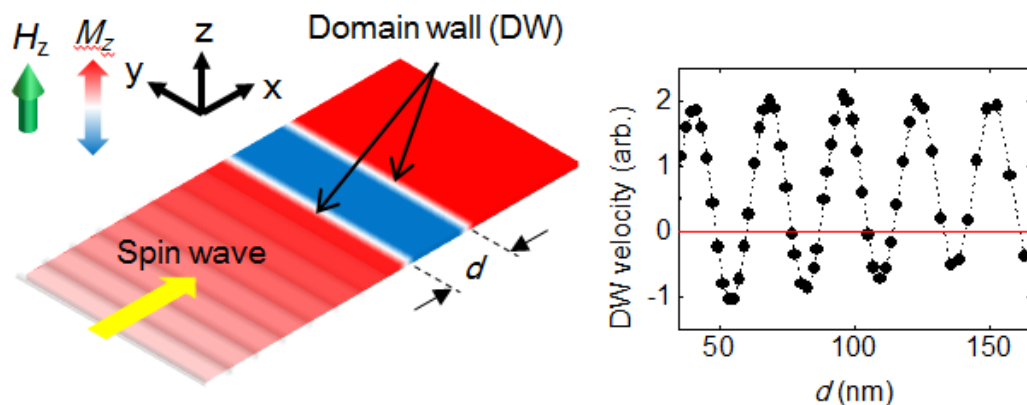


FIG. 1 A schematic diagram of the double domain walls state for simulations (left). Domain wall velocities as a function of the domain walls distances (right). The velocity exhibits an oscillating behavior.