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Domain wall propagation due to the synchronization with circularly polarized microwaves PENG YAN, XIANGRONG WANG, Physics Department, The Hong Kong University of Science and Technology — Finding a new control parameter for magnetic domain wall (DW) motion in magnetic nanostructures is important in general and in particular for the spintronics applications. Here, we show that a circularly polarized magnetic field (CPMF) at GHz frequency (microwave) can efficiently drive a DW to propagate along a magnetic nanowire. Two motion modes are identified: rigid-DW propagation at low frequency and oscillatory propagation at high frequency. Moreover, DW motion under a CPMF is equivalent to the DW motion under a uniform spin current in the current perpendicular to the plane magnetic configuration proposed recently by Khvalkovskiy et al. [Phys. Rev. Lett. 102, 067206 (2009)], and the CPMF frequency plays the role of the current.

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