Domain wall motion under the non-uniform transverse magnetic field with rigid domain structure CHUN-YEOL YOU, Dept. of Phys. Inha University — Another method for the domain wall movement in a nanowire geometry with rigid domain structure will be proposed. We find that a transverse domain wall move to the energy minimum position under a non-uniform transverse magnetic field in order to minimize the Zeeman energy. By the collective coordinate approach, the domain wall dynamics under non-uniform transverse magnetic field in nanowire geometry is investigated. The validity of concept of the present method and the domain wall equation of motion are confirmed by micromagnetic simulations. It is found that the domain wall velocity of a few 100 m/s can be obtained for the moderate conditions based on the analytic and numerical studies. The direction of the domain wall movement depends only on the magnetization direction inside of the domain wall itself, not on the one of the domain. Therefore, it is possible to achieve field driven domain wall motion with rigid domain structures. The non-uniform transverse magnetic field driven domain wall motion has a superior nature of the rigidity of the domain structure during the domain walls movement in addition to the all advantages of conventional field driven domain wall movement.

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