OVERCRITICAL MOTION OF BLOCH DOMAIN WALL IN ULTRATHIN FERROMAGNETIC FILMS

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9.7 cm

The overcritical domain wall (DW) dynamics in ultrathin ferromagnetic film without magnetic losses is considered. The overcritical motion occurs when DW energy exceeds critical Walker value and oscillatory processes become important. In overcritical region the DW energy is defined by two parameters: a) population number (n) of the lowest oscillatory level and b) angle (phi) of the magnetic moment declination out of the DW plane. The DW velocity is defined by this population number and should be calculated with the help of the Goldstone and Adler theorems. The Lagrangian maximization procedure with respect to phi at a given energy allows to find phi, n and DW velocity as a function of energy. In ideal film without magnetic losses the DW velocity in the overcritical region does not depend on time. Inhomogeneties of the film lead to the velocity time oscillations as well as magnetic losses. The stability region for the overcritical motion is also defined.

13.4 cm

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