

Engineering of magnetic properties of magnetic microwires

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Amorphous and nanocrystalline thin wires (typically of 1-30 μm in diameter) have attracted growing attention in the last few years owing to excellent soft magnetic properties, Giant Magnetoimpedance (GMI) effect and fast domain wall (DW) dynamics [1,2]. The principal advantages of these materials are inexpensive fabrication method allowing preparation of long and continuous microwires with aforementioned magnetic properties suitable for applications in magnetic sensors, magnetic memories or logics [2]. We demonstrated that magnetic properties (hysteresis loops, DW velocity and GMI effect) of amorphous microwires can be tailored by stress and conventional annealing. Observed dependences discussed considering stress relaxation, back stresses and change of the magnetostriction after samples annealing. Amorphous microwires with optimized GMI effect allows achieving of pT magnetic field sensitivity and can exhibit extremely high DW velocity (up to 4 km/s).

References:

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