Manipulation of a Single Domain Wall in Bistable Magnetic Microwire

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Abstract. Four different ways of creating an initial magnetic state with a single domain wall (DW) in bistable microwire are described. Experimental procedure to determine changes in axial magnetic flux (i. e. domain wall displacement) caused by applied constant as well as an alternating magnetic field for an initial magnetic state with a single DW is presented. Two magnitudes of total magnetic flux in the pick-up coil after creation of two domain structures were observed. These magnitudes were not dependent on the type of DW (head-to-head or tail-to-tail) but on the end of the microwire from which the DW was released and subsequently moved. It turns out that the DW displacement process is not affected by the DW type, but by the part of the microwire along which the DW moves. It has been experimentally confirmed that the DW remains in the same position after the applied constant axial magnetic field is turned off, independently of the methods of creating the initial magnetic state. An applied alternating magnetic field with low frequency (10 Hz) causes the DW position to change. The observed changes are different from those observed in microwires with unidirectional effect in DW propagation.