

AFD and ARM theory of single-domain assemblage

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Analytical expressions of the alternating field demagnetization (AFD) and anhysteretic remanent magnetization (ARM) were obtained for the single-domain assemblage. The previous works have some confusion in the assumptions (Jaep, 1971) and in mathematical calculations (Walton, 1988). We assume that the sinusoidal alternating field is acting on the non-interacting single-domain assemblage with a coherent coercivity caused by shape anisotropy. If the easy axis is parallel to the alternating field direction, TRM/ARM ratio is larger than 1.7, which is consistent with the experimental results. However, if the easy axis is inclined at an angle of 45 degree, TRM/ARM becomes smaller than 1. The magnetic interaction may generally play an important role in ARM acquisition.