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Effect of field sweep rate on magnetization dynamics of exchange-coupled nanocomposite magnets CHUANBING RONG, J. PING LIU, Department of Physics, University of Texas at Arlington, Arlington, TX 76019 — It has been found that magnetization dynamics of a nanocomposite magnet is different from that of single-phase magnets. Open recoil loops are considered as a characteristic for nanocomposite magnets. Recently, it is revealed that openness of recoil loops of nanocomposite magnets is strongly dependent on sweep rate of applied magnetic fields, while similar dependence for single-phase nanocrystalline magnets is not observed [1]. In this work, we studied the sweep-rate dependence of Henkel plots and first order reversal curves (FORC), reversible magnetization in the $FePt/Fe_3Pt$ nanocomposite magnets. was found that the positive peaks of Henkel plots, representing the strength of exchange coupling interactions, decreases with decreasing sweep rate. The reversible magnetization also decreases with decreasing sweep rate, especially in the nanocomposite magnets. More interestingly, it was found that the FORC with fast sweep rate shows a completely single-phase magnetic behavior, while a slight two-phase behavior with slow sweep rate. These phenomenacan be explained by the unstable magnetizations in the exchange-hardened magnetic soft phase. [1] C.B. Rong, Y. Liu, J. P. Liu, Appl. Phys. Lett., 93, 042508 (2008).

Chuanbing Rong

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