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Crystallinity Dependence of Irreversible Switching in Fe/SmCo and FeNi/FePt Spring Magnets J.E. DAVIES, G.T. ZIMANYI, KAI LIU, Physics Department - UC Davis, OLAV HELLWIG, BESSY, Germany, E.E. FULLERTON, Hitachi Global Storage Technologies, J.S. JIANG, S.D. BADER, Argonne National Laboratory — The effect of hard layer crystallinity on irreversible switching in Fe/SmCo and FeNi/FePt spring magnets was investigated by a First Order Reversal Curve (FORC) technique and vector magnetometry. In Fe/epitaxial-SmCo samples, the switching fields of the individual layers can be conventionally determined from steps in the major loop. The FORC diagram shows a distinct onset of irreversible switching at the hard layer switching field. Vector magnetometry reveals that most of the soft layer switches by rotation before reversal of the hard layer. In FeNi/polycrystalline-FePt samples, the switching fields are masked by the smooth and step-free major loop. The FORC diagram displays a single onset of irreversible switching, suggesting that the soft (FeNi) and hard (FePt) layers switch together. The co-rotation is confirmed by vector magnetometry. Despite the random anisotropy of the hard layer, an appreciable transverse moment bigger than just the soft layer contribution is observed. The successive vs. simultaneous rotation of the soft/hard layer is mainly due to different hard layer crystallinity.– Work is supported by NSF and DOE (BES-MS contract #W-31-109-ENG-38).

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