



(a). RHEED pattern of $\text{ErMn}_6\text{Sn}_6(0001)$ thin films. (b). In-plane hysteresis loops of ErMn_6Sn_6 thin films at different temperatures taken with SQUID. (c). AHE hysteresis loops of ErMn_6Sn_6 thin films at different temperatures. (d). RHEED pattern of $\text{TbMn}_6\text{Sn}_6(0001)$ thin films. (e). Out-of-plane hysteresis loops of TbMn_6Sn_6 thin films at different temperatures taken with SQUID. (f). Temperature dependence of remanence magnetization of TbMn_6Sn_6 thin films, suggesting out-of-plane to in-plane spin reorientation above $T = 300$ K.