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**Magneto-electric Coupling in Ferromagnetic Cobalt/Ferroelectric Copolymer Multi-layer Films** A. MARDANA, Dept. of Physics & Astronomy and Nebraska Center for Materials and Nanoscience, University of Nebraska-Lincoln, MENGJUN BAI, University of Missouri-Columbia, A. BARUTH, S. DUCHARME, S. ADENWALLA, Dept. of Physics & Astronomy and Nebraska Center for Materials and Nanoscience, University of Nebraska-Lincoln — We report on the magnetoelectric coupling of a thin multi-layer film sandwich consisting of ferromagnetic Cobalt (10 nm)/ferroelectric polymer (PVDF-TrFE)/ferromagnetic Cobalt (10 nm ).The metallic ferromagnetic 1mm wide electrodes are deposited perpendicular to each other through a shadow mask. The ferroelectric polymer films (53nm thick) are deposited by the Langmuir-Blodgett technique. The ferromagnetic and ferroelectric layers of the samples have been characterized by the Magneto-Optical Kerr Effect (MOKE) and the pyroelectric effect, respectively. After electrical saturation, the sample is placed in a magnetic field perpendicular to the plane of the sample. A large magneto-electric coupling is observed, with the pyroelectric response decreasing by $\sim 30\%$ on application of a 2kG field. Our observations indicate that the polarization change occurs abruptly at the closing of the magnetic hysteresis loop, shows little hysteresis and is even with magnetic field. The change is far too large to be accounted for by the magnetostriction of Co. Possible explanations for this unexpectedly large effect are discussed. NSF Grant No MRSEC DMR-0213808

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