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Magnetic and magnetotransport properties of organic trilayers of alkanedithiol self-assembled monolayers sandwiched between ferromagnetic thin films WILLIAM RICE, JEREMY NISKALA, JEFF HALLER, PAUL HOERTZ, WEI YOU, FRANK TSUI, University of North Carolina at Chapel Hill — Magnetic and magnetotransport properties of organic spin valve structures have been studied. The organic trilayer structure consists of a self-assembled monolayer (SAM) of alkanedithiol sandwiched between two ferromagnetic metal contacts, a Ni film as the bottom contact and a Co film as the top contact. The SAM was formed using novel methods on the Ni surface on the bottom of the vertical structure. Two alternative designs have been developed, one uses an additional conducting polymer layer for electrical isolation during thermal evaporation of the top Co contact and another uses nanotransfer printing to directly apply the top Co contact. Each trilayer was examined in vacuum using 4-terminal transport measurements. Both designs have indicated tunneling as the transport mechanism between contacts. Magnetooptic Kerr Effect (MOKE) measurements show independent switching of the ferromagnetic layers at approximately 50 and 100 Gauss. Magnetotransport measurements were carried out as a function of bias voltage, temperature and field, in order to explore spin-dependent transport through the organic interlayer.

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