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Finite size effects with variable range exchange coupling in thin-film Pd/Fe/Pd trilayers[1] RITESH DAS, RAJIV MISRA, SEFAATTIN TONGAY, RYAN RAIRIGH, ARTHUR HEBARD, University of Florida — The magnetic properties of thin-film Pd/Fe/Pd trilayers in which an embedded $\sim$1.5$\mathring{A}$-thick ultrathin layer of Fe induces ferromagnetism in the surrounding Pd have been investigated. The thickness of the ferromagnetic trilayer is controlled by varying the thickness of the top Pd layer over a range from 8 Å to 56 Å. As the thickness of the top Pd layer decreases, or equivalently as the embedded Fe layer moves closer to the top surface, the saturated magnetization normalized to area and the Curie temperature decrease whereas the coercivity increases. These thickness-dependent observations for proximity-polarized thin-film Pd are qualitatively consistent with finite size effects that are well known for regular thin-film ferromagnets. The functional forms for the thickness dependences, which are strongly modified by the nonuniform exchange interaction in the polarized Pd, provide important new insights to understanding nanomagnetism in two-dimensions.

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