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Magnetic structure and stability of 1D Co/Fe wires JESSICA BICKEL, MATTHIAS MENZEL, KIRSTEN VON BERGMANN, ANDRE KUBETZKA, ROLAND WIESENDANGER, Institute of Applied Physics, University of Hamburg — As device scales continue to decrease low dimensional structures are needed to take the place of wires and thick films. Particularly in the field of spintronics, it is important to develop 1D structures that can transmit information via the spin. This work realizes one method of spin transport via mixed Co/Fe 1D chains on Ir(001). Pure chains and mixed chains were examined by spin-polarized scanning tunneling microscopy (SPSTM) and spectroscopy. Both Fe and Co self-assemble into bi-atomic chains on the Ir(001)-(5x1) surface reconstruction. The Fe deposits as a single stacking chain while the Co exhibits two different stackings. When co-deposited, the materials can be differentiated from one another by spectroscopy due to differences in the local density of states. Spin-resolved measurements of pure Fe chains show a periodic spin-spiral along the entire length of the chain which is stabilized in an applied field but fluctuates at a speed greater than the time resolution of the STM in zero applied field. The Co, however, exhibits a ferromagnetic ground state that is stable at 8K. When the materials are co-deposited on the surface, the Co stabilizes the Fe spin-spiral and information about the magnetic state of the Co can be transmitted via the Fe spin-spiral.

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