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The growth of Manganese wires on Si(100): observation of the sub-monolayer coverage regime with STM HUI LIU, PETRA REINKE, University of Virginia — The study of thin film magnetic materials and the doping of semiconductors with magnetically active dopant atoms has received increased attention due their potential applications in magnetic memory devices and spintronics. We observe the deposition of Mn on the Si(100) 2x1 reconstructed surface in the sub-monolayer regime with STM. Short Mn wires with a length of 5 to about 20 atoms are formed an oriented perpendicular to the Si-dimer rows. At higher coverage some Mn wires are anchored with one end of the wire at the edge and extend onto the lower lying surface. The region in between the wires is particularly interesting: if the Mn wire distance is reduced the dimers change their orientation and are tilted, or begin to form zig-zag lines. The wire length and dimer deformation is likely governed by local strain. We will discuss the wire statistics (lengths, orientation, and position), control of their growth and present first data on the electronic structure of the wires. The growth of Si and Ge overlayers and incorporation of Mn wires in Ge-quantum dots is currently explored.

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