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Imaging of spin waves in atomically designed nanomagnets ANNA SPINELLI, BENJAMIN BRYANT, Delft University of Technology (TUD), Kavli insitute of nanoscience, Delft, the Netherlands, FERNANDO DELGADO, JOAQUÍN FERNÁNDEZ-ROSSIER, International Iberian Nanotechnology Laboratory (INL), Braga, Portugal, ALEXANDER F. OTTE, Delft University of Technology (TUD), Kavli insitute of nanoscience, Delft, the Netherlands — Exploring the transition from individual quantum spins to classical magnetism is crucial for the development of nanoscale magnetic memory storage solutions. Our aim is to search for signs of collective spin behavior in magnetic lattices built on a surface. Using the tip of a low temperature scanning tunneling microscope (STM), we position Fe atoms on a Cu_2N/Cu(100) network with atomic precision, to build ferromagnetically coupled spin chains up to 6 atoms that exhibit bistable behavior. Using a combination of inelastic electron tunnelling spectroscopy and spin polarized STM, we are able to probe the spin dynamics during the magnetization reversal of the whole chain, after a local excitation. Our experiments allow us to observe the nodal structure of the standing spin waves confined inside the chain, and, through combination with theoretical calculations, we can understand their role in making the system switch from one metastable magnetic state to the other. [A. Spinelli et al., Nature Materials 13, 782 (2014)]

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