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Observation and Manipulation of Subsurface Hydride in Pd(111) CHARLES SYKES, Tufts University, LUIS FERNÁNDEZ-TORRES, University of Puerto Rico at Cayey, SANJINI NANAYAKKARA, Penn State University, BRENT MANTOOTH, Geo-Centers, RYAN NEVIN, University of Wisconsin-Madison, PAUL WEISS, Penn State University — We have observed and manipulated hydrogen atoms beneath the surface of a Pd(111) crystal using low-temperature scanning tunneling microscopy (STM). The subsurface region of Pd can be populated with hydrogen atoms from the bulk by applying voltage pulses from a STM tip. Topographic and local electronic data characterizing subsurface hydrogen in these stable sites is presented. We discuss our ability to selectively populate subsurface sites with hydrogen and present a full STM characterization of this state. This phenomenon is explained with an inelastic excitation mechanism, whereby hydrogen atoms in the bulk are excited by tunneling electrons and are promoted to more

stable sites in the subsurface region.

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