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Probing electron correlation effects of Ni(111) with STM KEES FLIPSE, Eindhoven University of Technology, K. BRAUN, Ohio University, Athens, USA, A. GRECHNEV, M. KATSNELSON, Radboud University of Nijmegen, The Netherlands, K. RIEDER, Free University of Berlin, Germany — The role of electron correlation effects in the electronic structure of Ni-metal has been attracting interest for a long time. Here we present an extensive scanning tunneling microscopy and spectroscopy investigation on Ni(111) at low temperature which shows a parabolic surface state with a surprisingly low effective mass compared to the noble metals like Au, Ag and Cu and a d-surface resonance showing an electron-electron interaction signature which can be understood by a many-body calculation of the electronic structure (DMFT). For the first time, a small energy shift and a significant broadening of the electron state due to electron-electron correlation effects are obtained in a STM experiment. This opens the possibility to study electron many-body effects of surface states in detail with a very high energy resolution on a clean and defect free part of the surface.

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