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Magnetization measurements of a two-leg spin-1/2 ladder with strong leg interactions K. NINIOS, University of Florida, TAO HONG, Oak Ridge National Laboratory, S.N. HERRINGER, M.M. TURNBULL, C.P. LANDEE, Clark University, Y. TAKANO, University of Florida, H.B. CHAN, The Hong Kong University of Science and Technology — We have measured the magnetization of a single crystal of the spin-1/2 ladder compound bis(2,3-dimethylpyridinium) tetrabromocuprate (DIMPY), using micromechanical force magnetometry down to 30mK. DIMPY undergoes a quantum phase transition from a gapped phase with no long-range magnetic order to a gapless phase, at critical field H_c . Recent specific heat results by Hong et al. show that the gapless phase is a Tomonaga-Luttinger liquid (TLL). Low temperature magnetic susceptibility as a function of field exhibits a maximum near H_c , in consistence with the divergence of the zero temperature susceptibility at H_c expected for an ideal 1-D system. A clear minimum in the magnetization of the gapless phase as a function of temperature is observed, a minimum that marks the limit below which the TLL exists. In addition the field dependence of the TLL parameter K is studied.

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