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Wilson ratio of a Tomonaga-Luttinger liquid in a spin-1/2 Heisenberg ladder[1] TAO HONG, Quantum Condensed Matter Division, Oak Ridge National Laboratory, K. NINIOS, Y.H. KIM, University of Florida, T. MANABE, C. HOTTA, Kyoto Sangyo University, G. TREMELLING, S.N. HERRINGER, M.M. TURNBULL, C. LANDEE, Clark University, H.-J. KANG, NIST, K.P. SCHMIDT, G.S. UHRIG, TU Dortmund, H.B. CHAN, University of Florida, C. BROHOLM, The Johns Hopkins University, Y. TAKANO, University of Florida — We report a comprehensive study of a strong-leg spin-1/2 ladder compound (C7H10N)2CuBr4 (DIMPY) by specific heat, magnetocaloric effect, magnetization and inelastic neutron scattering measurements. DIMPY is shown to be a perfect one-dimensional Heisenberg antiferromagnet with a spin gap=0.32 meV. Above a critical field Hc and at temperature below 1 K, the specific heat exhibits asymptotic linear-T behavior, characteristic of a Tomonaga-Luttinger liquid (TLL). In this field and temperature region, the specific heat in conjunction with the susceptibility yields the Wilson ratio R_W. The result supports the relation $R_W = 4K$, where K is the TLL parameter.

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