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Nodeless Ground State Symmetry of $YBa_2Cu_3O_{7-\delta}$ DALE R. HARSHMAN, Physikon Res. Corp., Lynden, WA 98264; Dept. of Physics, U. of Notre Dame, Notre Dame, IN, 46556; Dept of Physics, Arizona State U., Tempe, AZ 85287, ANTHONY T. FIORY, Dept. of Physics, New Jersey Institute of Technology, Newark, NJ 07102, JOHN D. DOW, Dept of Physics, Arizona State U., Tempe, AZ 85287 — Muon spin rotation measurements were conducted on a single-crystal of $YBa_2Cu_3O_{7-\delta}$ (T_c = 91.3 K) as a function of temperature and magnetic field [1]. By correctly accounting for the temperature-activated fluxon depinning and disorder known to exist in these and other high-quality $YBa_2Cu_3O_{7-\delta}$ crystals grown today, the underlying ground state symmetry was found to be nodeless, consistent with s-wave (or extended s-wave) pairing. This result is in agreement with earlier data acquired on samples with strongly pinned vortices. The best fit was obtained assuming the two-fluid model. Analysis of the data assuming a d-wave gap function proved to be extremely unsatisfactory. In fact, the probability that the d-wave model tested gives a better fit than the two-fluid model is less than 4 $\times 10^{-6}$. By ignoring the effects of fluxon depinning, others have erroneous claimed evidence of d-wave pairing. This result effectively negates that possibility.

1. D. R. Harshman et el., Phys. Rev. B **69**, 174505 (2004).

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