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Large oxygen-isotope shift above the quantum critical point of $\text{Y}_{1-x}\text{Ca}_x\text{Ba}_2\text{Cu}_3\text{O}_{7-\delta}$ ¹ JOHN MANN, PIEDER BEELI, GUO-MENG ZHAO, Department of Physics and Astronomy, California State University, Los Angeles — We have studied the oxygen-isotope effect on the superconducting transition temperature T_c in overdoped $\text{Y}_{1-x}\text{Ca}_x\text{Ba}_2\text{Cu}_3\text{O}_{7-\delta}$ with $x = 0.10, 0.20,$ and 0.25 . We find the oxygen-isotope exponent α_O to be small (~ 0.02) for $x = 0.10$ but substantial (~ 0.1) for $x = 0.20$ and 0.25 . The doping level above which α_O increases sharply coincides with a quantum critical point where the normal-state pseudogap starts to diminish. The present isotope-effect experiments provide direct and quantitative constraints on the pairing mechanism of high-temperature superconductivity in cuprates.

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