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Negative Oxygen Isotope Effect on the Static Spin Stripe Order in $La_{2-x}Ba_xCuO_4$ ($x = 1/8$) ZURAB GUGUCHIA, RUSTEM KHASANOV, Laboratory for Muon Spin Spectroscopy, Paul Scherrer Institute, Switzerland, MARKUS BENDELE, Physik-Institut der Universitat Zurich, Zurich, Switzerland, EKATERINA POMJAKUSHINA, KAZIMIERZ CONDER, Laboratory for Developments and Methods, Paul Scherrer Institut, Switzerland, ALEXANDER SHENGELAYA, Department of Physics, Tbilisi State University, Tbilisi, Georgia, HUGO KELLER, Physik-Institut der Universitat Zurich, Zurich, Switzerland — Cuprate high temperature superconductors (HTS's) are characterized by a complex interplay between lattice, charge, and spin degrees of freedom. One of the remarkable phases is a self-organized charge/spin structure, which is known as "stripes" and is observed in some cuprates near 1/8 doping. The microscopic origin of the stripe phase is still unclear at present. We report large negative oxygen-isotope ($^{16}O/^{18}O$) effects (OIE's) on the static spin-stripe ordering temperature T_{so} and the magnetic volume fraction V_m in $La_{2-x}Ba_xCuO_4$ ($x = 1/8$) observed by means of muon spin rotation experiments [1]. The corresponding OIE exponents were found to be $\alpha_{T_{so}}$ = -0.57(6) and α_{V_m} = -0.71(9), which are sign reversed to $\alpha_{T_c} = 0.46(6)$ measured for the superconducting transition temperature T_c. This indicates that the electron-lattice interaction is involved in the stripe formation and plays an important role in the competition between bulk superconductivity and static stripe order in the cuprates.
[1] Z. Guguchia et. al., Phys. Rev. Lett. 113, 057002 (2014).

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