

Abstract Submitted
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Isotope substitution induced lattice expansion in the iron based superconductors MATS GRANATH, University of Gothenburg, OLEG KIM, ITAI PANAS, Chalmers University of Tech. — In the iron based superconductors there are indications of a wide range of exponents for the iron isotope effect on T_c in different families of these materials. In this work we explore to what extent this spread of exponents may be a result of different isotope induced lattice expansions in combination with an extreme sensitivity of T_c to the interatomic distances. We estimate the magnitude of anharmonicity in the dominant Fe-As(Se) bond based on a model fit of the temperature dependence of Raman phonon frequencies. Using a variational approach to treat the effect of the anharmonic potential we calculate the magnitude and sign of the expansion of lattice parameters and interatomic distances due to Fe isotope substitution in several different iron-based superconductors.

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