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SUPERCONDUCTIVITY AND MAGNETISM IN THE A15 PHASE OF ALKALI-DOPED FULLERIDES

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Superconductivity and Magnetism in the A15 Phase of Alkali-Doped Fullerides

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ABSTRACT

As the superconductors can conduct electric current without resistance, the potential application of superconductors in technology can have a revolutionized impact. Therefore, superconductivity research has been at the heart of modern condensed matter physics and material science research for decades. One of the basic properties of superconductors is the expulsion of magnetic fields. The discovery of Alkali-doped fullerides with the composition of A_3C_{60} , doped with $A = K, Rb, Cs$ have attracted tremendous interest due to the unexpected coexistence of superconductivity and magnetism. We study the competition/cooperation and interplay between superconductivity and magnetism of alkali doped fulleride compounds using a recently developed model. We use a modified mean-field theory with a variational approach to map out the phase diagram in temperature-pressure space.

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