

Abstract Submitted  
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**Global phase diagram of the spinless Falicov-Kimball model in  $d = 3$ : renormalization-group theory**<sup>1</sup> OZAN S. SARIYER, Koç University, MICHAEL HINCZEWSKI, University of Maryland, A. NIHAT BERKER, Sabanci University — The global phase diagram of the spinless Falicov-Kimball model in  $d = 3$  spatial dimensions is obtained by renormalization-group theory [1]. This global phase diagram exhibits five distinct phases. Four of these phases are charge-ordered (CO) phases, in which the system forms two sublattices with different electron densities. The phase boundaries are second order, except for an intermediate interaction regime, where a first-order phase boundary between two CO phases occurs. The first-order phase boundary is delimited by special bicritical points. The cross-sections of the global phase diagram with respect to the chemical potentials of the localized and mobile electrons, at all representative interaction and hopping strengths, are calculated and exhibit three distinct topologies. The phase diagrams with respect to electron densities are also calculated.

[1] O.S. Sariyer, M. Hinczewski, and A.N. Berker, arXiv:1002.1821v1 (2010).

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