

Abstract Submitted
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Quantum phases of grain boundaries in solid ^4He ¹ DEBAJIT GOSWAMI, KINJAL DASBISWAS, ALAN DORSEY, Department of Physics, University of Florida — First-principles Monte Carlo simulations show that the core of a dislocation in solid ^4He is superfluid and has Luttinger-liquid like properties [Phys. Rev. Lett. **99**, 035301 (2008), Phys. Rev. Lett. **103**, 175301 (2009)]. Low angle grain boundaries in crystals can be thought of as a linear array of dislocations, suggesting that a grain boundary in solid ^4He can be modeled as an array of coupled Luttinger liquids. By exploiting this analogy, in this work we study the quantum phases of the grain boundary, as well as analogies with dipolar condensates in one dimensional optical lattices.

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