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Binding energy of ^{3}He to dislocations in solid ^{4}He[1] DEBAJIT GOSWAMI, KINJAL DASBISWAS, CHI-DEUK YOO, ALAN T. DORSEY, Department of Physics, University of Florida — Recent heat capacity experiments on solid ^{4}He [1] show a peak in the specific heat which is interpreted as the signature of the supersolid transition. We pursue an alternative explanation for the heat capacity feature in which ^{3}He impurities desorb from dislocations in solid ^{4}He; the peak temperature scales with the binding energy of ^{3}He to dislocations in ^{4}He. Within a continuum elastic model for solid ^{4}He, we make quantum mechanical estimates for the binding energy, using a combination of variational and numerical methods. We find for a short distance cut-off of one lattice constant of ^{4}He, the binding energy is about 70 mK for edge and 60 mK for a screw dislocation.

[1] X. Lin, A. C. Clark, and M. H. W. Chan, Nature **449**, 1025 (2007).

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Debajit Goswami
Department of Physics, University of Florida

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