Effect of $^3$He impurity on the supersolid transition of $^4$He

EUNSEONG KIM, MOSES H. W. CHAN, The Pennsylvania State University — The supersolid phase of $^4$He was revealed by a series of torsional oscillator experiments.[1] One of the most intriguing features of the supersolid transition is the broadening of the transition and the enhancement of $T_c$ by the addition of extremely small amount of $^3$He impurity. This effect is very different from that in superfluid film and that in ‘bulk’ superfluid helium. We have investigated the influence of $^3$He on the supersolid transition by systematically diluting isotopically-pure $^4$He ($^3$He impurity less than 0.3ppb) with $^3$He. [1] E. Kim and M. H. W. Chan, Science 305, 1941 (2004); Nature 425, 227 (2004); J. Low Temp. Phys. 138, 859 (2005)

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