Probable heat capacity signature of the supersolid transition

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We report our heat capacity measurements [1] of solid $^4$He down to 40mK, well into the apparent supersolid region of the phase diagram. We observed a broad peak in the specific heat centered near 75mK in $^4$He samples containing 1ppb, 0.3ppm, and 10ppm $^3$He impurities. In addition, our measurements of samples containing 10ppm and 30ppm of $^3$He have revealed a temperature-independent contribution to the heat capacity that scales with the number of isotopic impurities. New measurements with higher resolution are in progress.


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