

Abstract Submitted
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Observation of a 2D Bose-gas: from thermal to quasi-condensate to superfluid ANAND RAMANTHAN, PIERRE CLADÉ, CHANGHYUN RYU, KRISTIAN HELMERSON, WILLIAM PHILLIPS, Laser Cooling and Trapping Group, NIST, Gaithersburg — We present experimental results on a Bose gas in the quasi-2D geometry near the Berezinskii, Kosterlitz and Thouless (BKT) transition temperature. By measuring the density profile, in situ and after time of flight, and the coherence length of the gas, we identify different states of the gas. In particular, we observe that the gas develops a bimodal distribution without long range order. In this state, the gas presents a longer coherence length than the thermal cloud; it is quasi-condensed, but not superfluid. Experimental evidence seems to indicate that we are observing the transition towards superfluidity (BKT transition).

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