Contribution ID: **9** Type: **Contributed talk**

Coherent fraction of an equilibrium condensate

Wednesday 4 September 2024 12:20 (20 minutes)

We report recent progress on the measurement of the coherent fraction of a two-dimensional Bose gas in thermal equilibrium. We have created a homogeneous exciton-polariton gas in equilibrium, realizing the textbook paradigm of a uniform Bose Gas in two-dimensions. Under these conditions, we have measured the coherent fraction of this Bose gas from very low density up to density well above the condensation threshold. These measurements reveal a consistent power law for the coherent fraction over nearly three orders of its magnitude. The same power law is seen in numerical simulations solving the two-dimensional Gross-Pitaevskii equation for the equilibrium coherence; these simulations also show that the power law corresponds to the coherence length in the system growing with a power law of 1.6 as a function of the total density. This power law has not been predicted by prior analytical theories.

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References

Short bio (50 words) or link to website

I am a fifth-year graduate student working with Dr. David Snoke at the University of Pittsburgh.

Relevant publications (optional)

https://arxiv.org/abs/2308.05100
https://www.science.org/doi/full/10.1126/sciadv.adi6762

Career stage

Student

Authors: SNOKE, David W (University of Pittsburgh); ALNATAH, Hassan (University of Pittsburgh); Mr BEAUMARIAGE, Jonathan (University of Pittsburgh); WEST, Kenneth W (Princeton University); BALDWIN, Kirk (Princeton University); PFEIFFER, Loren N (Princeton University); Dr TAM, Man Chun (University of Waterloo); Mr YAO, Qi (University of Pittsburgh); Dr MUKHERJEE, Shouvik (University of Maryland and National Institute); Dr WASILEWSKI, Zbigniew (University of Waterloo)

Presenter: ALNATAH, Hassan (University of Pittsburgh)

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