Tan's Two-Body Contact in a Planar Bose Gas

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We theoretically determine Tan's two-body contact in a planar Bose gas in the framework of the nonperturbative functional renormalization group. We use the thermodynamic definition of the contact where the latter is related to the derivation of the pressure with respect to the three-dimensional scattering length of the quasi-two-dimensional Bose gas. Without any free parameter, we find a remarkable agreement with the ENS experiment [1] from low to high temperatures, including the vicinity of the Berezinskii-Kosterlitz-Thouless transition.

References

[1] Y-Q Zou, B Bakkali-Hassani, C Maury, É Le Cerf, S Nascimbene, J Dalibard anf J Beugnon, Nat. Commun. **12**, 760 (2021)