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Pair correlations in the two-dimensional Fermi gas VUDTIWAT NGAMPRUETIKORN, University of Cambridge, JESPER LEVINSEN, Aarhus Institute of Advanced Studies, MEERA M. PARISH, London Centre for Nanotechnology — We consider the two-dimensional Fermi gas at finite temperature with attractive short-range interactions. Using the virial expansion, which provides a controlled approach at high temperatures, we determine the spectral function and contact for the normal state. Our calculated spectra are in qualitative agreement with recent photoemission measurements [M. Feld et al., Nature 480, 75 (2011)], thus suggesting that the observed pairing gap is a feature of the high-temperature gas rather than being evidence of a pseudogap regime just above the superfluid transition temperature. We further argue that the strong pair correlations result from the fact that the crossover to bosonic dimers occurs at weaker interactions than previously assumed.

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