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Theory of two-dimensional polarized Fermi gases BRANDON ANDERSON, CHIEN-TE WU, RUFUS BOYACK, K. LEVIN, James Franck Institute — In this talk we apply a version of BCS-BEC theory (which is explicitly compatible with the Mermin-Wagner theorem) to study the signatures of quasi-condensation in two-dimensional polarized Fermi superfluids, with and without traps. The approach we use is well calibrated, as it captured [1] the important features of recent experiments [2,3] in unpolarized 2D Fermi gases. Here, in contrast to 3D gases there is no condensate. Nevertheless for a quasi-condensed state we show: how and where phase separation occurs, where balanced core phases (as reported in the literature) emerge, and where states with finite net momentum pairing can possibly occur. [1] Phys. Rev. Lett. 115, 240401 (2015) [2] Phys. Rev. Lett. 114, 230401 (2015) [3] Phys. Rev. Lett. 115, 010401 (2015)

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