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Pseudogap Effects in Rotating Fermi Gases from BCS to BEC PETER SCHERPELZ, VIVEK MISHRA, DAN WULIN, KATHRYN LEVIN, James Franck Institute and Department of Physics, University of Chicago, ATTIPAT RAJAGOPAL, Inspire Institute — In this talk we focus on pseudogap effects present in a rotating, ultracold Fermi gas as the system is tuned from a BCS regime to a BEC regime. Such pseudogap effects are expected to be present away from the BCS regime [1]. Importantly, no theory of rotating Fermi gases has yet incorporated these non-condensed pair effects. Our work is based on reformulating the Gor'kov equations, with the inclusion of a pseudogap, into a Landau level basis [2]. With this reformulation we can calculate quantities including the local density of states in the presence of vortices, and the upper critical rotation frequency. In a related way we present linear response calculations in the presence of a pseudogap which include the shear viscosity and moment of inertia. We show that finite size effects give rise to a non-classical moment of inertia even in the normal state. Testable predictions resulting from this theory, as well as connections with high temperature superconductors, will also be discussed.

[1] Stajic *et al.* Phys. Rev. A **69** 063610 (2004).
[2] Scherpelz *et al.* arXiv: 1112.1112.

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