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Kinematics and Thermodynamics of an Interacting 2D Fermi Gas
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tracold gases of fermionic atoms have become an important paradigm for study-
ing many-body quantum phenomena. One example is a two-component 2D ultra-
cold Fermi gas with tunable interactions that will allow the study of the Bardeen-
Schrieffer-Cooper to Berzinskii-Kosterlitz-Thouless superfluid crossover. To effec-
tively investigate this area we need to establish the conditions for which an interact-
ing Fermi gas subject to tight transverse confinement behaves kinematically 2D. We
will present results that indicate both a geometric and interaction driven departure
from the 2D regime as the atom number and interaction strength are varied, allow-
ing us to identify the regime where interacting systems are kinematically 2D. This
provides the parameter range where we investigate the 2D equation of state (EoS)
where all atoms are confined to the transverse ground state. We adapt a scheme
previously used for the 3D unitary Fermi gas and 2D Bose gas to obtain the density
EoS and other thermodynamical variables.

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