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Bosonic models with Fermi-liquid kinematics: realizations and properties PAUL GOLDBART, SARANG GOPALAKRISHNAN, Univ. of Illinois at Urbana-Champaign, AUSTEN LAMACRAFT, Univ. of Virginia — We consider models of interacting bosons in which the single-particle kinetic energy achieves its minimum on a surface in momentum space. The kinematics of such models resembles that resulting from Pauli blocking in Fermi liquids; therefore, Shankar's renormalization-group treatment of Fermi liquids [1] can be adapted to investigate phase transitions in these bosonic systems. We explore possible experimental realizations of such models in cold atomic gases: e.g., via spin-orbit coupling [2], multimode-cavity-mediated interactions [3], and Cooper pairing of Fermi gases in spin-dependent lattices. We address the phase structure and critical behavior of the resulting models within the framework of Ref. [1], focusing in particular on Bose-Einstein condensation and on quantum versions of the Brazovskii transition from a superfluid to a supersolid [3].

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