Abstract Submitted
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Theory of superconducting quantum liquid crystals[1] DANIEL BARCI, University of the State of Rio de Janeiro, Rua São Francisco Xavier 524,Rio de Janeiro, RJ, 20550-013,Brazil, EDUARDO FRADKIN, University of Illinois at Urbana-Champaign,1110, W. Green St., Urbana, IL 61801-3080, USA. — A novel superconductor state, whose order parameter oscillates producing a *pair density wave* (PDW), in which charge, spin and superconducting orders are intertwined, was recently proposed[2]. The PDW necessarily has charge density wave(CDW) modulations with double period and a novel homogeneous superconducting order with $4e$ charged quasi-particles(4eSC)[3]. The PDW is an anisotropic quantum liquid with nematic symmetry. In this work, we present a theory of smectic and superconductor fluctuations, given by PDW, CDW and 4eSC order parameters, in a nematic background. Our theory closely resembles the description of the smectic-nematic phase transition in classical liquid crystals. We compute the effect of the director fluctuations on the correlations of each ordered phase. We also make contact with the theory of thermal melting.

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[2]E. Berg, E. Fradkin, S.A. Kivelson, Phys.Rev. B79, 064515 (2009)
[3]E. Berg, E. Fradkin, S.A. Kivelson, Nature Phys. 5, 830 (2009)

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