

Abstract Submitted  
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**Pairing in half-filled Landau level**<sup>1</sup> ZHIQIANG WANG, UCLA, IP-SITA MANDAL, Perimeter Institute for Theoretical Physics, Canada, SUK BUM CHUNG, Center of Correlated Electron Systems, IBS, Seoul National University, Korea; Department of Physics and Astronomy, Seoul National University, Korea, SUDIP CHAKRAVARTY, UCLA — Pairing of composite fermions in half-filled Landau level state is reexamined by solving the BCS gap equation with full frequency dependent current-current interactions. Our results show that there can be a continuous transition from the Halperin-Lee-Read state to a chiral odd angular momentum Cooper pair state for short-range contact interaction. This is at odds with the previously established conclusion of first order pairing transition, in which the low frequency effective interaction was assumed for the entire frequency range. We find that even if the low frequency effective interaction is repulsive, it is compensated by the high frequency regime, which is attractive. We construct the phase diagrams and show that  $\ell = 1$  angular momentum channel is quite different from higher angular momentum channel  $\ell \geq 3$ . Remarkably, the full frequency dependent analysis applied to the bilayer Hall system with a total filling fraction  $\nu = \frac{1}{2} + \frac{1}{2}$  is quantitatively changed from the previously established results but not qualitatively. Reference: Annals of Physics, 351, 727 (2014).

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