

Abstract Submitted
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Theory of Transport Phenomena in Coherent Quantum Hall Bilayers¹ ALLAN H. MACDONALD, HUA CHEN, University of Texas at Austin, INTI SODEMANN, Massachusetts Institute of Technology — We will describe a theory that allows to understand the anomalous transport properties of the excitonic condensate state occurring in quantum quantum Hall bilayers in terms of a picture in which the condensate phase is nearly uniform across the sample, and the strength of condensate coupling to interlayer tunneling processes is substantially reduced compared to the predictions of disorder-free microscopic mean-field theory. These ingredients provide a natural explanation for recently established I-V characteristics which feature a critical current above which the tunneling resistance abruptly increases and a non-local interaction between interlayer tunneling at the inner and outer edges of Corbino rings. We propose a microscopic picture in which disorder is the main agent responsible for the reduction of the effective interlayer tunneling strength.

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