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Superconductivity with Unconventional Pair Symmetry in a 2D System with Inherent Gap RENYUAN LIAO, KHANDKER QUADER, Kent State University — We study superconductivity in a 2D system with “inherent” gap; semiconducting gap is chosen as a prototypical case. We consider s and d wave pair symmetries, and carry out a mean-field study of the evolution of the order parameter and critical temperature, T_c , with varying interaction strength, doping and the inherent gap magnitude. The model 2D system exhibits a rich variety of transition and crossover behavior, including a “pseudogap-like” feature. To better understand pair-breaking, we also study phase fluctuations, and compare our calculated Kosterlitz-Thouless temperature, T_c^{KT} with our mean-field T_c .

Khandker Quader
Kent State University

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