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Potential-energy (BCS) to kinetic-energy (BEC)-driven pairing in the attractive Hubbard model[1] BUMSOO KYUNG, University of Sherbrooke, ANTOINE GEORGES, Centre de Physique Théorique, École Polytechnique, ANDRE-MARIE TREMBLAY, University of Sherbrooke, UNIVERSITY OF SHERBROOKE COLLABORATION, CENTRE DE PHYSIQUE THÉORIQUE, ÉCOLE POLYTECHNIQUE COLLABORATION — The BCS-BEC crossover within the two-dimensional attractive Hubbard model is studied by using the Cellular Dynamical Mean-Field Theory both in the normal and superconducting ground states. Short-range spatial correlations incorporated in this theory remove the normal-state quasiparticle peak and the first-order transition found in the Dynamical Mean-Field Theory, rendering the normal state crossover smooth. For U smaller than the bandwidth, pairing is driven by the potential energy, while in the opposite case it is driven by the kinetic energy, resembling a recent optical conductivity experiment in cuprates. Phase coherence leads to the appearance of a collective Bogoliubov mode in the density-density correlation function and to the sharpening of the spectral function.

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