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Non-conservation of Fermionic Degrees of Freedom at Low-energy in Doped Mott Insulators SEUNGMIN HONG, SHILADITYA CHAKRABORTY, PHILIP PHILLIPS, University of Illinois, Urbana-Champaign — We show that the low-energy fermionic degrees of freedom in a doped Mott insulator described by the Hubbard model possesses a chemical potential that is less than that of the bare electrons. Consequently, the Landau one-to-one correspondence between bare electrons and fermionic quasiparticles breaks down explicitly. This state of affairs obtains because the hole number is not conserved as it contains a dynamical contribution. Any experimental probe that couples to the low-energy dynamics of a doped Mott insulator, quantum oscillation experiments included, should be interpreted in terms of the total dynamically generated hole number than the bare value.

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