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Principle of Maximum Entanglement Entropy and Local Physics of Correlated many-body Electron-Systems NICOLA LANATA, Department of Physics and Astronomy, Rutgers University, Piscataway, New Jersey 08856-8019, USA, HUGO STRAND, Department of Physics, University of Gothenburg, SE-412 96 Gothenburg, Sweden, YONGXIN YAO, Ames Laboratory-U.S. DOE and Department of Physics and Astronomy, Iowa State University, Ames, Iowa IA 50011, USA, GABRIEL KOTLIAR, Department of Physics and Astronomy, Rutgers University, Piscataway, New Jersey 08856-8019, USA — We argue that, because of the quantum-entanglement, the local physics of the strongly-correlated materials at zero temperature is described in very good approximation by a simple generalized Gibbs distribution, which depends on a relatively small number local quantum thermodynamical potentials. We demonstrate that our statement is exact in certain limits, and we perform numerical calculations of the iron compounds FeSe and FeTe and of the elemental cerium by employing the Gutzwiller Approximation (GA) that strongly support our theory in general.

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