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**Non-Local Corrections to the Dynamical Mean Field Theory for the Hubbard Model** HERBERT FOTSO, Department of Physics and Astronomy, Louisiana State University, SHUXIANG YANG, KA-MING TAM, JUANA MORENO, MARK JARRELL, Department of Physics and Astronomy, Louisiana State University, HARTMUT HAFERMANN, Centre de Physique Theorique, Ecole Polytechnique, Paris, France, DEPARTMENT OF PHYSICS AND ASTRONOMY, LOUISIANA STATE UNIVERSITY COLLABORATION, CENTRE DE PHYSIQUE THEORIQUE, ECOLE POLYTECHNIQUE, PARIS, FRANCE COLLABORATION — We use the diagrammatic parquet formalism to calculate the non-local corrections to the Dynamical Mean Field Theory (*DMFT*) solution for the two-dimensional Hubbard model. The Dynamical Mean Field Theory vertex and Green's function are used as input to calculate the Feynman diagrams on a finite size cluster. This approach properly addresses the local as well as the short-range correlations, as illustrated by the agreement of the obtained local moment and the Neel critical temperature with Quantum Monte Carlo calculations on a 4x4 cluster.

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