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Pseudogap and antiferromagnetic correlations in the Hubbard model ALEXANDRU MACRIDIN, University of Cincinnati, MARK JARRELL, University of Cincinnati, THOMAS MAIER, Oak Ridge National Laboratory, PAUL KENT, University of Tennessee, CARSTEN HONERKAMP, University of Wurzburg — Using the dynamical cluster approximation we calculate the single-particle spectra of the Hubbard model with next-nearest neighbor hopping t' at small doping. We find that the pseudogap along the zone diagonal in the electron doped systems is due to long range antiferromagnetic correlations. The physics in the proximity of $(0, \pi)$ is dramatically influenced by t'and determined only by the short range correlations. The effect of t' on the low energy ARPES spectra is weak except close to the zone edge. The short range correlations are sufficient to yield a pseudogap in the magnetic susceptibility and produce occupied states in the second antiferromagnetic Brillouin zone which develop a gap with decreasing temperature. We compare our self-energy with the one obtained form renormalization group (RG) calculations. In order to analyze the importance of scattering in different channels we analyze the self energy using a simple ansatz motivated by RG calculations.

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