Abstract Submitted
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**Charge dynamics in doped cuprates**[1] MACIEJ MASKA, MARCIN MIERZEJEWSKI, University of Silesia, Poland, EVGENY KOCHETOV, Joint Institute for Nuclear Research, Russia, JANEZ BONCA, University of Ljubljana, Slovenia — It has recently been suggested that contrary to common belief, the quantum spin fluctuations of the antiferromagnetic background may not be crucial in explaining the dynamical properties of quasiparticles in strongly correlated systems near half-filling (see H. Ebrahimnejad, *et al.* Nature Physics **10**, 951 (2014)). In accordance with this suggestion, we demonstrate that the $t$-$J$ model even without the transverse spin components reproduces many of the ARPES results, provided that the three-site term, usually neglected in calculations, is properly taken into account. The dynamical properties of doped charges are calculated with the help of the Monte Carlo method combined with exact diagonalization. The validity of neglecting the spin-flip processes in the Ising version of the $t$-$J$ model is checked by a comparison with results of a fully quantum approach based on exact diagonalization in the limited functional space (EDLFS). Our method allows us to show how the spectral properties of doped holes change for a wide range of the doping level. We also demonstrate that the effective model reveals a tendency towards formation of charge density waves.

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