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Connecting spin and charge response in electron-doped cuprates
ANDREAS SCHNYDER, Condensed Matter Theory Group, Paul Scherrer Institute, CH-5232 Villigen PSI, Switzerland, DIRK MANSKE, Max Planck Institut fur Festkorperforschung, Heisenbergstrasse 1, D-70569 Stuttgart, Germany — We perform a detailed analysis of angle-resolved photoemission data from electron-doped cuprates [1,2] in order to extract both the self-energy and the bare dispersion of the quasiparticles. The self-energy contains important information about the interactions among the quasiparticles. Taking the extracted bare quasiparticle dispersion as an input parameter we compute dynamical response functions employing a spin-fluctuation-based theory. In particular we estimate the dynamical spin susceptibility, which we then compare to recent inelastic neutron scattering data [3]. We obtain a resonance at the anti-ferromagnetic ordering wavevector (π, π), whereas incommensurate spin excitations are mostly suppressed. Our approach provides a consistent theoretical description of both the spin and charge response in electron-doped cuprates.

[1] H. Matsui *et al.*, Phys. Rev. Lett. **94**, 047005 (2005).
[2] H. Matsui and T. Takahashi, private communication.
[3] S. D. Wilson *et al.*, Phys. Rev. B **74**, 144514 (2006).

Andreas Schnyder
Condensed Matter Theory Group, Paul Scherrer Institute,
CH-5232 Villigen PSI, Switzerland

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