Abstract Submitted
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Magnetic transitions and quantum criticality in the three-dimensional Hubbard model[1] THOMAS SCHÄFER, Institute of Solid State Physics, Vienna University of Technology, Vienna, Austria, ANDREY KATANIN, Institute of Metal Physics, Ural Federal University, Ekaterinburg, Russia, KARSTEN HELD, ALESSANDRO TOSCHI, Institute of Solid State Physics, Vienna University of Technology, Vienna, Austria — We analyze the (quantum) critical properties of the simplest model for electronic correlations, the Hubbard model, in three spatial dimensions by means of the dynamical mean field theory (DMFT, including all local correlations) and the dynamical vertex approximation (DΓA, including non-local correlations on all length scales). Both in the half-filled/unfrustrated [1] and in the hole-doped system [2] the transition temperature is significantly lowered by including non-local fluctuations.

In the latter case, however, the magnetic order becomes incommensurate, eventually leading to a complete suppression of the order and giving rise to a magnetic quantum critical point (QCP) at zero temperature [2]. We analyze the (quantum) critical properties of this QCP (e.g. critical exponents) and relate our findings to the standard theory of quantum criticality in metals, the Hertz-Millis-Moriya theory.

[1] G. Rohringer, A. Toschi, A. A. Katanin, and K. Held, Phys. Rev. Lett. **107**, 256402 (2011).
[2] T. Schäfer, A. A. Katanin, K. Held, and A. Toschi, in preparation.

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