Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Ab initio approach to magnon-electron coupling PAWEL BUCZEK, ARTHUR ERNST, LEONID M. SANDRATSKII, HARDY GROSS, Max Planck Institute of Microstructure Physics, Weinberg 2, Halle/S., Germany — The electronic properties of magnets and exchange-enhanced paramagnets are strongly influenced by the spin-flip fluctuations. In particular, their important role in the pnictide high-temperature superconductivity is has been conjectured [Mazin & Johannes, *Nat. Phys.* **5**, 141 (2009)]. To formulate a parameter free model of electron-electron interaction involving emission and absorption of magnons we combine our recently developed implementation of the linear response time dependent density functional theory for spin fluctuations [Buczek *et al.*, *Phys. Rev. Lett.* **105**, 097205 (2010)] with the methods of many body perturbation theory [Vignale & Singwi, *Phys. Rev. B* **32**, 2156 (1985); Zhukov *et al.*, *Phys. Rev. Lett.* **93**, 096401 (2004)]. This theoretical toolbox is applied to the description of recent inelastic tunneling spectroscopy experiments [Balashov *et al.*, *Phys. Rev. Lett.* **97**, 187201 (2006)], which have shown that the emission of magnons by electrons can open additional tunneling channels and increase conductivity. As second application, we discuss a scheme of the magnon mediated Cooper pair formation in PdH_x and LaFeAsO.

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Date submitted: 24 Nov 2010 Electronic form version 1.4