Abstract Submitted
for the DAMOP09 Meeting of
The American Physical Society

Sorting Category: 2.1 (C)

Study of shake-up states in helium by XUV-IR pump-probe experiments[1] S. NAGELE, J. FEIST, R. PAZOUREK, E. PERSSON, J. BURGDÖRFER, Institute for Theoretical Physics, Vienna University of Technology, Austria, EU, B.I. SCHNEIDER, Physics Division, NSF, USA, L.A. COLLINS, Theoretical Division, LANL, USA — The rapid progress in the creation of attosecond pulses paves the way towards time-resolved control and observation of ultrafast electronic dynamics. In a recent XUV-IR pump-probe experiment Uiberacker *et al.* [1] studied the ionization dynamics of shake-up states in Neon ions. The overall stepwise structure of the resulting double ionization yield as a function of the delay time between the two pulses results from incoherent tunneling of the excited shake-up states. However, recent theoretical studies [2,3] suggest that coherent effects play an important role as well. In addition, the influence of the IR field on the shake-up process might have significant effects. Since a full *ab initio* treatment of Ne atoms in external fields is not feasible, we will study the process for helium where the full multi-electron dynamics can still be solved numerically. In particular, we will investigate the role of coherent effects, electronic interactions, and the presence of the IR field in the shake-up process. [1] M. Uiberacker et al., *Nature* **446**, 627 (2007) [2] A.K. Kazansky et al., *EPL* **82**, 13001 (2008) [3] S. Nagele et al., *to be published*

[1]Work supported by the FWF-Austria, Grant SFB016.

Stefan Nagele
stefan.nagele@tuwien.ac.at
Institute for Theoretical Physics,
Vienna University of Technology, Austria, EU

[X] Prefer Oral Session
[ ] Prefer Poster Session

Date submitted: 23 Jan 2009

Electronic form version 1.4