Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

The dynamics of meta-stable states described with a complex scaled Hamiltonian EVA LINDROTH, JAKOB BENGTSSON, SøLVE SELSTø, Stockholm University — The laser development has given access to light pulses in the femto- and subfemtosecond regime and thereby opened the possibility to follow electron dynamics directly in the time domain. Of special interest is the dynamics of *resonant states*, and pioneering experimental studies were made a few years ago on the Auger decay of inner-shell vacancies. We present a new method for time-dependent calculations of the whole sequence of events when an atom is exposed to a short light pulse followed by the population of a meta-stable state, and with the possibility to follow its subsequent decay by electron ejection. We use the method of complex scaling and show how it can be used together with the time-dependent Schrödinger equation. Important advantages with this approach are; the meta-stable states are obtained as unique eigenstates to the field-free complex scaled Hamiltonian and the continuum is adequately represented by a very modest number of eigenstates. We have tested our approach against conventional methods for hydrogen and established the connection to Floquet theory for monochromatic radiation.

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Date submitted: 02 Feb 2007 Electronic form version 1.4