Angular dependence of Wigner time delay: Relativistic Effects A.
MANDAL, P. C. DESHMUKH, IIT-Madras, S. T. MANSON, Georgia State U., A.
S. KKEIFETS, Australian National U. — Laser assisted photoionization time delay
mainly consists of two parts: Wigner time delay, and time delay in continuum-
continuum transition [1]. Wigner time delay results from the energy derivative of
the phase of the photoionization amplitude (matrix element). In general, the pho-
toionization time delay is not the same in all directions relative to the incident
photon polarization [2], although when a single transition dominates the amplitude,
the resultant time delay is essentially isotropic. The relativistic-random-phase ap-
proximation [3] is employed to determine the Wigner time delay in photoionization
from the outer np subshells of the noble gas atoms, Ne through Xe. The time delay
is found to significantly depend on angle, as well as energy. The angular dependence
of the time delay is found to be quite sensitive to atomic dynamics and relativis-
tic effects, and exhibit strong energy and angular variation in the neighborhood of
Cooper minima [4]. Work supported by DOE, Office of Chemical Sciences and DST
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Steven T. Manson
Georgia State University

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