Theodoros Mercouris

Publications

1. *Theory and calculation of resonances using complex coordinates*
   C.A.Nicolaides, Y.Komninos and Th.Mercouris
   Int.J.Qu.Chem., S15, 355 (1981)

2. *The width of He $2s2p$ $^1P^o$ from a variational calculation using*
   complex coordinates
   C.A.Nicolaides, Y.Komninos and Th.Mercouris
   Phys.Lett. 84A, 421 (1981)

3. *Many-electron theory of autoionising states using complex coordina-*
   tes : The position and the partial and total widths of the Ne^+ 1s hole
   state
   C.A. Nicolaides, Th.Mercouris and Y.Komninos
   Int.J.Qu.Chem. 26, 1017 (1984)

4. *Localized and asymptotic electron correlation in autoionising states*
   in terms of complex coordinates
   Th.Mercouris and C.A.Nicolaides
   J.Phys.B17, 4127 (1984)

5. *Partial widths and interchannel coupling in autoionising states in te-*
   rms of complex eigenvalues and complex coordinates
   C.A.Nicolaides and Th.Mercouris
   Phys.Rev.A32, 3247 (1987)

6. *Solution of the Complex Eigenvalue Schrödinger equation for the*
   Rydberg series of inner hole excited autoionising states. The Be
   $1s2s^2np$ (n=2-5) $^3P^o$ and $^1P^o$ series
   Th.Mercouris and C.A.Nicolaides
   Z.Phys.D5, 1 (1987)

7. *Partial autoionisation widths of inner hole states of Ov from the*
   complex-eigenvalue Schrödinger equation
   C.A.Nicolaides and Th.Mercouris
   Phys.Rev.A36, 390 (1987)

8. *Polyelectronic theory of atoms in strong laser fields. CO_2 – laser*
   7 – photon ionisation of H^-
   Th.Mercouris and C.A.Nicolaides
   J.Phys.B21, L285 (1988)

9. *Multiphoton ionisation of negative ions in the precence of a dc field.*
   Application to Li^-
   C.A.Nicolaides and Th.Mercouris
   Chem.Phys.Lett.159, 145 (1989)

10. *Many-Electron,Many-Photon theory of atoms in strong fields*
    C.A.Nicolaides and Th.Mercouris
    "Atoms in Strong Fields",Ed. by C.A.Nicolaides et al,Plenum Press
    New York, p.353 (1990)

11. *Laser ionisation of H^- in the precence of a DC field.*
    Th.Mercouris and C.A.Nicolaides
    J.Phys.B23, 2037 (1990)

12. *Many-electron,Many-photon theory of nonlinear polarizabilities*
    C.A.Nicolaides, Th.Mercouris and G.Aspromallis
    J.Opt.Soc.Am.B7, 494 (1990)

13. *Partial and total widths of the resonances of the H^- ^1S two-electron*
    ionisation ladder
    M.Chrysos, Y.Komninos, Th.Mercouris and C.A.Nicolaides
    Phys.Rev.A42, 2634 (1990)

14. *Dynamic polarizability and hyperpolarizability of H^- for frequen-*
    cies below as well as above the ionisation threshold
    C.A.Nicolaides, Th.Mercouris and N.Piangos
    J.Phys.B23, L669 (1990)

15. *Predissociation resonances from the complex eigenvalue Schrödinger*
    equation
    I.D.Petsalakis, Th.Mercouris, G.Theodoracopoulos and
    C.A.Nicolaides
    J.Phys.B23, L89 (1990)

16. *Distributed complex Gaussian basis set: A useful function space for*
    the solution of predissociation problems via the complex eigenvalue
    Schrödinger equation. Application to the isotope effect of NeH, NeD
    I.D.Petsalakis, Th.Mercouris, G.Theodoracopoulos and C.A.Nicolai-
    des
    Chem.Phys.93, 6642 (1990)

17. *Above-threshold ionisation in the precence of a DC-field. Application*
    to H^-
    Th.Mercouris and C.A.Nicolaides
    J.Phys.B24, L57 (1991)

18. *The meaning of correlations in the theory of multiphoton detachment*
    Th.Mercouris and C.A.Nicolaides
    J.Phys.B24, L165 (1991)

19. *Theory and ab-initio calculation of partial widths and interchannel*
    coupling in predissociating diatomic states.Application to HeF
    I.D.Petsalakis, Th.Mercouris, G.Theodoracopoulos and
    C.A.Nicolaides
    Chem.Phys.Lett.182, 561 (1991)

20. *Magnitude of static and dynamic polarizabilities of doubly excited states of negative ions: Application to the second bound state of H⁻*
C.A.Nicolaides and Th.Mercouris
Phys.Rev.<u>A44</u>, 7827 (1991)

21. *Computation of the widths of doubly excited states coupled by external AC or DC fields*
Th.Mercouris and C.A.Nicolaides
J.Phys.<u>B24</u>, L557 (1991)

22. *Theory of multiphoton ionisation tested on negative ions*
Th.Mercouris and C.A.Nicolaides
Phys.Rev.<u>A45</u>, 2116 (1992)

23. *Time-dependent laser-induced molecular formation from repulsive surfaces*
Th.Mercouris, I.D.Petsalakis and C.A.Nicolaides
Chem.Phys.Lett.<u>208</u>, 197 (1993)

24. *Quantitative study of multiphoton multiple ionisation: Second harmonic Nd:YAG laser ionisation of the doubly excited $2p^2\ {}^3P$ bound state of H^-*
Th.Mercouris and C.A.Nicolaides
Phys.Rev.<u>A48</u>, 628 (1993)

25. *Above and below threshold multiphoton dissociation of volcanic ground states.Application to BeH^{2+}*
C.A.Nicolaides, Th.Mercouris and I.D.Petsalakis
Chem.Phys.Lett.<u>212</u>, 685 (1993)

26. *Time dependent studies of multiphoton processes*
Th.Mercouris, Y.Komninos, S.Dionissopoulou and C.A.Nicolaides
in "Multiphoton Processes" Ed. by D.K.Evans and S.L.Chin
World Scientific, London, p.115 (1994)

27. *Laser Induced Molecular Formation (LIMF)*
I.D.Petsalakis, Th.Mercouris and C.A.Nicolaides
in "Multiphoton Processes" Ed. by D.K.Evans and S.L.Chin
World Scientific, London, p.161 (1994)

28. *Many-Electron,Many-Photon Theory of Nonstationary Srares*
C.A.Nicolaides, Th.Mercouris, Y.Komninos and I.D.Petsalakis
Int.J.of Qu.Chem.<u>51</u>, 529 (1994)

29. *Time-dependent multiphoton absorption by NO^{2+}: above and below threshold dissociation and the effect of the first excited surface*
Th.Mercouris, I.D.Petsalakis, P.Valtazanos and C.A.Nicolaides
J.Phys.<u>B27</u>, L519 (1994)

30. *Computation of strong-field multiphoton processe in polyelectronic*

atoms: State-specific method and applications to H and Li $^-$
Th.Mercouris, Y.Komninos, S.Dionissopoulou and C.A.Nicolaides
Phys.Rev.<u>A50</u>, 4109 (1994)

31. *Computation of time-dependent transition probabilities in excimer molecules induced by femtosecond laser pulses*
I.D.Petsalakis, Th.Mercouris and C.A.Nicolaides
Chem.Phys.<u>189</u>, 615 (1994)

32. *High-order harmonic generation and ATI in H: Calculations using expansions over field-free state-specific wavefunctions*
S.Dionissopoulou, Th.Mercouris, A.Lyras, Y.Komninos and C.A.Nicolaides
Phys.Rev.<u>A51</u>, 3104 (1995)

33. *High-order Above Threshold Ionisation Spectrum of Hydrogen and Photoelectron Angular Distributions*
S.Dionissopoulou, A.lyras, Th.Mercouris, and C.A.Nicolaides
J.Phys.<u>B28</u>, L109 (1995)

34. *Time-dependent multiphoton ionisation from the He 1s2s ^{1}S metastable state*
C.A.Nicolaides, S.Dionissopoulou and Th.Mercouris
J.Phys.<u>B29</u>, 231 (1996)

35. *Effect on observables of the singularity in the multiphoton free-free dipole matrix elements*
Th.Mercouris, Y.Komninos, S.Dionissopoulou and C.A.Nicolaides
J.Phys.<u>B29</u>, L13 (1996)

36. *On the violation of the exponential decay law in atomic Physics: Ab initio calculation of the time-dependence of the He $^-$ 1s2p^2 ^{4}P nonstationary state*
C.A.Nicolaides and Th.Mercouris
J.Phys.<u>B29</u>, 1151 (1996)

37. *Multielectron,multichannel problems and their solution to all-orders via the diagonalization of state-specific complex eigenvalue Schrödinger equations*
C.A.Nicolaides, Th.Mercouris and S.I.Themelis
in 'New Methods in Quantum Theory' Ed. by C.A.Tsipis et. al.
Kluwer Academic Publishers p.135 (1996)

38. *Ionisation rates and harmonic generation for H interacting with laser pulses of λ = 1064 nm and peak intensities in the range $2X10^{13}$ - $2X10^{14}$ W cm^{-2}*
S.Dionissopoulou, Th.Mercouris and C.A.Nicolaides
J.Phys.<u>B29</u>, 4787 (1996)

39. *Time-dependence and properties of nonstationary states in the continous spectrum of atoms*

Th.Mercouris and C.A.Nicolaides
J.Phys.<u>B30</u>, 811 (1997)

40. *The electric dipole approximation and the calculation of free-free transition matrix elements in multiphoton processes*
Th.Mercouris, Y.Komninos, S.Dionissopoulou and C.A.Nicolaides
J.Phys.<u>B30</u>, 2133 (1997)

41. *Strong laser-field effects in hydrogen: High-order above-threshold ionisation and photoelectron angular distributions*
S.Dionissopoulou, Th.Mercouris, A.Lyras and C.A.Nicolaides
Phys.Rev.<u>A55</u>, 4397 (1997)

42. *Multiphoton response of He to short laser pulses of wavelength 248 nm and intensities in the range $10^{14} – 10^{16}$ W cm^{-2}*
Th.Mercouris, S.Dionissopoulou and C.A.Nicolaides
J.Phys.<u>B30</u>, 4751 (1997)

43. *Theory and computation of electron correlation in the continous spectrum: Double photoionisation cross section of H⁻ and He near and far from threshold*
C.A.Nicolaides, C.Haritos and Th.Mercouris
Phys.Rev.<u>A55</u>, 2830 (1997)

44. *The significance of electron correlation and of state symmetries in the interaction of strong laser pulses of 5 eV with He*
C.A.Nicolaides, S.Dionissopoulou and Th.Mercouris
J.Phys.<u>B31</u>, L1 (1998)

45. *Single and double photoionization cross sections of the He⁻ 1s2s2p $^4P^o$ state at and far from threshold, from the many-electron, many-photon theory.*
C.Haritos, Th. Mercouris and C.A.Nicolaides
J.Phys.<u>B31</u>, L783 (1998)

46. *Does a delta function atom interacting with a superstrong laser pulse exhibit stabilization?*
Th. Mercouris and C.A. Nicolaides
J.Phys.B<u>32</u>, 2371 (1999)

47. *Nonperturbative theory and computation of the nonlinear response of He to dc- and ac- fields.*
Th. Mercouris, S.I. Themelis and C. A. Nicolaides
Phys. Rev. <u>A61,</u> 013407 (2000)

48. *Quantum mechanical versus semiclassical calculations of dc-field induced tunneling rates for Helium, for field strengths in the range 0.067-1.0a.u..*
S.I. Themelis, Th. Mercouris and C. A. Nicolaides
Phys. Rev. <u>A61</u>, 024101 (2000)

49. *Variation of harmonic generation from He interacting with short laser pulses of 5 eV as a function of pulse rise time and intensity*
S. Dionissopoulou, Th. Mercouris and C.A. Nicolaides
Phys.Rev. <u>A61</u>, 063402 (2000)

50. *The continuous spectrum in the solution of the time-dependent Schrödinger equation for laser-atom interactions*
Theodoros Mercouris and Cleanthes A Nicolaides
J.Phys. <u>B33</u>, 2095 (2000)

51. *Nonperturbative multiphoton detachment rates of H⁻ and their relation to the electronic structure of the initial state.*
C.A. Nicolaides, C. Haritos and Th. Mercouris
J.Phys. <u>B33</u>, 2733(2000)

52. *Multiphoton detachment rates of H⁻ for weak and strong fields*
C. Haritos, Th. Mercouris and C.A. Nicolaides
Phys.Rev. <u>A63</u>, 013410(2000)

53. *Dichromatic polyphotonic ionization rate of He λ_1=248nm and λ_2=(1/3)248nm from the many-electron, many-photon theory.*
Th. Mercouris and C.A. Nicolaides
J.Phys. <u>B33</u>, 4673(2000)

54. *He in two color ac-fields of λ_1=248nm and λ_2=(1/m)248nm, m=2,3,4. The rate of multiphoton ionization, for weak fields, is a simple function of the phase.*
Th. Mercouris and C.A. Nicolaides
Physica B. <u>296</u>, 271 (2001)

55. *He in dichromatic weak or strong ac-fields of λ_1 =248 nm and λ_2=(1/m) 248 nm, m=2,3,4.*
Th. Mercouris and C.A. Nicolaides
Phys. Rev. <u>A63</u>, 013411 (2000)

56. *The multiphoton ionization rate and the energy shift of atoms interacting with weak dichromatic fields with commensurate frequencies are simple functions of the phase difference.*
Th. Mercouris and C.A. Nicolaides
Eur. Phys. J. <u>D14</u>, 241 (2001)

57. *Theory and computation of the rate of multiphoton two-electron ionization via the direct mechanism*
Th. Mercouris, C. Haritos and C. A. Nicolaides
J.Phys. <u>B34</u>, 3789 (2001)

58. *Stationarity coefficients and short-time deviations from exponential decay in atomic resonance states*
Th. Mercouris and C. A. Nicolaides
Phys. Rev. <u>A65</u>, 012112 (2002)

59. *Theory and computation of the matrix elements of the full interaction of the electromagnetic field with an atomic state. Application to the Rydberg and the continuous spectrum*
 Y. Komninos, Th. Mercouris and C. A. Nicolaides
 Phys. Rev. A65, 043412 (2002)

60. *Electric dipole vs. full interaction in the dynamics of laser excitation of Rydberg wavepackets*
 Th. Mercouris, Y. Komninos and C. A. Nicolaides
 J. Phys. B35, 1439 (2002)

61. *Attosecond dynamics of electron correlation in doubly excited atomic states*
 C. A. Nicolaides, Th. Mercouris, and Y. Komninos
 J. Phys. B35, L271 (2002)

62. *Solution of the many-electron many-photon problem for strong fields: Application to Li⁻ in one and two-color laser fields*
 Th. Mercouris and C.A. Nicolaides
 Phys. Rev. A. 67, 063403 (2003)

63. *Theory and computation of the attosecond dynamics of pairs of electrons excited by high-frequency short light pulses*
 Th. Mercouris, Y. Komninos, and C. A. Nicolaides
 Phys. Rev. A. 69, 032502 (2004)

64. *Controllable surfaces of path interference in the multiphoton ionization of atoms by a weak trichromatic field*
T. Mercouris and C.A. Nicolaides,
J. Opt B-Quantum SO7 (10), S403 (2005).

65. *Interference generalized cross-section for the multiphoton detachment of H⁻ in dichromatic fields*
T. Mercouris, C. Haritos and C.A. Nicolaides,
J. Phys. B 38, 399 (2005).

66. *Long-wavelength approximation in on- and off-resonance transitions*
Y. Komninos, T. Mercouris and C.A. Nicolaides,
Phys. Rev. A 71, 023410 (2005).

67. *Time dependent formation of the He 2s2p $^1P^o$ state excited by a short laser pulse*
Th. Mercouris, Y. Komninos and C.A. Nicolaides,
Phys. Rev. A.75, 013407 (2007).
DOI: 10.1103/PhysRevA.75.013407

68. *Quantum and classical dynamics of a diatomic molecule in laser fields with frequency in the region producing maximum dissociation*
K.I. Dimitriou, V. Constantoudis, Th. Mercouris, Y. Komninos and C.A. Nicolaides,
Phys. Rev. A. 76, 033406 (2007).
DOI: 10.1103/PhysRevA.76.033406

69. *Time-resolved hyperfast processes of strongly correlated electrons during the coherent excitation and decay of multiply excited and inner-hole excited states*
Th. Mercouris, Y. Komninos, and C.A. Nicolaides,
Phys. Rev. A. 76, 033417 (2007)
DOI:10.1103/PhysRevA.76.033417

70. *Ab-initio calculation of time-dependent control dynamics in polyelectronic systems involving bound and resonance states. Application to a quartet spectrum of He$^-$*
Y. Komninos, Th. Mercouris and C.A. Nicolaides,
Phys. Rev. A. 77, 013412 (2008).
DOI:10.1103/PhysRevA.77.013412

71. *Classical chaos and its relations to quantum dynamics in the case of multiphoton dissociation of the Morse oscillator*
V. Constantoudis, L.P. Konstantinidis, K.I. Dimitriou, Th. Mercouris and C.A. Nicolaides,
Nonlinear Phenomena in Complex Systems 11, 292 (2008).

72. *Time-dependent formation of the profile of resonance atomic states and its dependence on the duration of ultrashort pulses from free-electron lasers*
C.A. Nicolaides, Th. Mercouris and Y. Komninos,
Phys. Rev. A. 80, 055402 (2009).
DOI: 10.1103/PhysRevA.80.055402

73. *The State-Specific Expansion Approach to the Solution of the Polyelectronic Time-Dependent Schrödinger Equation for Atoms and Molecules in Unstable States*
Theodoros Mercouris, Yannis Komninos and Cleanthes A. Nicolaides,
in volume 60 of *Advances in Quantum Chemistry*, eds. C. A. Nicolaides and E. J. Brändas, , p.333 (2010).
DOI:10.1016/S0065-3276(10)60006-8

74. *Delay in Photoemission*
M. Schultze, ….Th. Mercouris, Y. Komninos, C. A. Nicolaides, …F. Krausz and V. S. Yakovlev,
Science 328, 1658 (2010)
DOI:10.1126/science.1189401

75. *Nonperturbative computation of the time-resolved formation of the profile of autoionizing states as a function of the intensity and duration of ultrashort pulses*
Th. Mercouris, Y. Komninos, and C.A. Nicolaides,
Phys. Rev. A 83, 015403 (2011).
DOI:10.1103/PhysRevA..83.015403

76. *Regular series of doubly excited states inside two-electron continua: Application to $2s^2$-hole states in neon above the Ne^{2+} $1s^2 2s^2 2p^4$ and $1s^2 2s 2p^5$ thresholds*
Y. Komninos, Th. Mercouris, and C.A. Nicolaides,
Phys. Rev. A 83, 022501 (2011).
DOI: 10.1103/PhysRevA..83.022501

77. *Structure and calculation of field-induced free-free transition matrix elements in many-electron atoms*
Y. Komninos, Th. Mercouris, and C.A. Nicolaides,
Phys. Rev. A 86, 023420 (2012).
DOI:10.1103/PhysRevA.86.023420

78.   "Erratum:Time dependent formation of the He 2s2p $^1P^o$ state excited
by a short laser pulse.[Phys. Rev. A. **75**, 013407 (2007)]"
Th. Mercouris, Y. Komninos, and C. A. Nicolaides
Phys. Rev. A. 87, 069905 (2013)
DOI: 10.1103/PhysRevA.87.069905

Ab Initio many-electron calculation of hyperfast time-resolved coherent excitation and decay of polyelectronic atoms, C.A. Nicolaides, Th. Mercouris and Y. Komninos, AIP CP963, vol. 1, p. 560 (2008), Computational Methods in Science and Engineering, Theory and Computation: Old Problems and New Challenges, Ed. by G. Maroulis and T. Simos.