IPPJ-AM-29

BIBLIOGRAPHY ON ATOMIC PROCESSES IN HOT DENSE PLASMAS

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5) Plasma Research Center, The University of Tsukuba
6) Department of Physics, Hiroshima University
7) Department of Physics, Okayama University

Abstract

A bibliographic compilation on atomic processes in hot dense plasmas is given. The information on energy level, f or A value, bound-free transition, free-free transition, collision and stopping power is compiled as well as the literature information.

Introduction

This is a bibliography on atomic processes in hot dense plasmas which are connected with the inertial confinement fusion and astrophysics. This compilation covers papers up to May 1983. They are stored in our computer retrieval system as a database named HIDENS. The compiled information is shown in Table I. The references are listed here separately for the energy level, f or A value, bound-free transition, free-free transition, the collision process, the stopping power and others. The information for each reference is listed as follows

Ref. No. Author
Journal name, Vol., Page, Year
Title
A) Method
B) Element, Temperature range, Density range, Energy range
C) Quantities studied
D) Comments

The present activity of bibliographic compilation has been performed as a working group on Atomic Process in Plasmas at the Research Information Center in the Institute of Plasma Physics in Nagoya.

Table I

Compiled information in HIDENS

Reference Number

Author, Journal name, Volume, Page, Year

Title

Theory or Experiment

Method

Quantity studied

1) energy level	2) f or A value
3) b-f transition	4) f-f transition
5) collision	6) stopping power
7) population	8) others

Element

Temperature range, Density range, Energy range

Comments

Aknowledgements

The authors would like to thank the members of the working group for atomic processes in hot dense plasma, Profs. T.Nakamura, T.Watanabe and T.Fujimoto for their useful discussions and kind help.

They are also very grateful to Drs. H. Suzuki and R. Ogasawara in Kyoto University for making the retreival and output system of HIDENS.

62E 1 Berg,H.F. Ali,A.W. Lincke,R. Griem,H.R.
Phys.Rev. 125 199-206 (1962)
Measurement of Stark profiles of neutral and ionized helium and hydrogen lines from shock-heated plasmas in electromagnetic T tubes
A) Exp shock tubes
B) H, He, He II 1-5 eV ne=10(17)/cm(3)
C) shift line profile
D) He II 4686A blue-shift (polarization of plasma)

66T 3 Stewart,J.C. Pyatt,K.D.
Astrophys.J. 144 1203-1211 (1966)
Lowering of ionization potentials in plasmas
A) Theory finite-temperature Thomas-Fermi model
B) undefined undefined undefined
C) continuum lowering
D) relationship between the Debye-Huckel, ionsphere and Thomas-Fermi predictions

68T 1 Carson,T.R. Hollingsworth,H.M.
Mon.Not.R.Astron.Soc. 141 77-108 (1968)
A critique of the hydrogenic approximation in the calculation of stellar opacity
A) Theory hydrogenic approximation
B) Z=1-26 10(2)-10(3) eV Pg=10(-1.5)-10(5.5) Mbar
C) energy level absorption cross section opacity

70E 1 Sassi,M. Herman,L. Coulaud,G.
Phys.Letters 32A 549-550 (1970)
Relative intensities and relative shifts of the 2p-4f and 2p-4d LiI lines as a function of electron concentration
A) Exp generalized impact theory
B) undefined 4x10(3) K ne=10(15), 8x10(15), 1.6x10(16)/cm(3)
C) shift
D) the experimental results are compared with the theoretical ones

70T 2 Roger,F.J. Graboske,H.J. Harwood,D.J.
Phys.Rev.A 1 1577-1586 (1970)
Bound Eigenstates of Static Screened Coulomb Potential
A) Theory Debye-screened potential
B) hydrogenic ion (Z+1) X a0<D <(Z+1) X 10(3) a0 undefined
C) energy level

71E 1 Burgess,D.D. Peacock,N.J.
J.Phys.B 4 L94 (1971)
Reduced limits on the magnitude of possible plasma polarization shifts
A) Exp spatially-resolved plasma spectroscopy
B) O VI, K IX, C VI undefined near the target surface
C) plsama polarization shift

D) No plasma polarization shifts were observed in 0.05A - 0.03A accuracy in wavelength measurement

72T 1 Rozsnyai,B.F.
Phys.Rev.A 5 1137 (1972)
Relativistic Hartree-Fock-Slater calculations for arbitrary temperature and matter density
A) Theory AA model (The self consistent-field treatment with relativistic Thomas-Fermi-Dirac model)
B) Fe(26), Rb(37) 0, 100 eV n=0.1n0, n0, 20n0
C) Energy levels and populations electron pressure
D) An algorithm to calculate electronic levels and the equation of state of atoms is presented

73E 1 Gabriel,A.H. Volonte,S.
Phys.Letters 43A 372-374 (1973)
Plasma polarization shift for members of the resonance series of ionized helium
A) Exp T-type shock tube
B) He II 3.8-3.9 eV 9X10(17)-10(18)/cm(3)
C) shift of He II resonance lines
D) blue shift consistent with n**2(n**2+1) dependence predicted by Greim et al (1970)

73T 1 Rozsnyai,B.F.
J.Quant.Spectrosc.Radiat.Transfer 13 1285 (1973)
Photoexcitation and photoionization of atoms at arbitrary temperature and matter density
A) Theory self-consistent Hartree-Fock-Slater model
B) He, Al, Cs He(0eV), Al(0-100eV), Cs(100, 1000eV) n=0.01 n0-n0
C) excitation energies and bandwidth f-value photoionization cross section

74E 1 Goto,T. Burgess,D.D.
J.Phys.B 7 857-864 (1974)
Plasma polarization shifts of He II resonance lines
A) Exp z-pinch plasma
B) He II 3.2 eV ne=1.4X10(17)/cm(3)
C) He II resonance series, shift
D) 0.03A blue shift for 9p-1s

74T 2 Roussel,K.M. O'Connel,R.F.
Phys.Rev.A 9 52 (1974)
Variational solution of schrodinger's equation for the static screened coulomb potential
A) Theory screened Coulomb Potential
B) H D=5-100 a0 D=5-100 a0
C) binding energies Transition probabilities A

75E 1 Galanti,M. Peacock,N.J.
J.Phys.B 8 2427 (1975)
Quantitative x-ray spectroscopy of the light-absorption region at the surface of laser-irradiated polyethylene
A) Exp Inglis - Teller
B) C(n+), n= 3 - 6 50-300 eV 10(20)-5X10(21) e/cc
C) Lyman series limit

75T 1 Rozsnyai,B.F.
J.Quant.Spectrosc.Radiat.Transfer 15 695-699 (1975)
Screening effects upon spectral line in hot matter
A) Theory Self-Consistent Hartree-Fock-Slater Average Atom Model
B) He, Li He (0, 10eV); Li (0, 2eV) He 10(-6)-10(-3) g/cc; Li 10(-5)-10(-2) n0
C) energy levels, excitation energies f-value

76E 1 Vanzandt,J.R. Adcock,J.C. Griem,H.R.
Phys.Rev.A 14 2126-2132 (1976)
Shift and width measurements of the Stark-broadened ionized helium line at 1215A
A) Exp electromagnetic shock tube
B) He II about 3 eV about 2X10(17)/cm(3)
C) shifts of He II 1640, 1215A stark profile
D) 1215A (n=4-2) red shift of less than 0.5A (consistent with semiclassical estimate of plasma polarization shift)

76T 2 Rozsnyai,B.F.
CECAM Workshop U.V. and X-ray spectra of hot and dense plasma 55-77 (1977)
Temperature and density effects on spectral lines in hot dense plasma
A) Theory Average atom model
B) Al XII, Al XIII 300 eV, 1 keV 10(20), 10(21), 10(22) ions/cm(3)
C) excitation energies f-value photoabsorption(f-f) photoabsorption(b-f) Line profile, Compton scattering
D) CECAM(Centre Europeen de Calcul Atomique et Moleculaire) Workshop Orsay, August 1 - September 30, 1976.

77T 2 Rozsnyai,B.F.
J.Quant.Spectrosc.Radiat.Transfer 17 77-88 (1977)
Spectral lines in hot dense matter
A) Theory Average atom model
B) Be, Ge plasma Be(21eV), Ge(144eV) Be 10(19)-10(21) atoms/cm(3), Ge 10(19)-10(22) atoms/cm(3)
C) excitation energies, line widths f-value photoabsorption cross section
D) An algorithm is presented for the computation of photoabsorption cross section

78E 2 Lee,C.M. Hauer,A.
Appl.Phys.Lett. 33 692 (1978)
Measurements of compressed core density of laser-imploded targets by x-ray continuum-edge shift
A) Exp T-F shell model, Stewart-Pyatt model
B) Ne 240 eV 0.3 g/cm(3)
C) recombination continuum edge e + Ne+9, e + Ne+10

79E 1 Jaegle,P. Carillon,A. Jamelot,G. Wehenkel,C
J. de Phys. Lett. 40 L551 (1979)
Spatial-dependent shift of spectral lines in
Laser-Produced plasmas
A) Exp grazing-incidence spectrometer with a toroidal
mirror
B) Al+10, +9 undefined 5X10(21)/cm(3)
C) Line shift

79E 2 Neiger,M. Griem,H.R.
Phys.Rev.A 14 291-299 (1979)
Experimental investigation of Stark broadening and
plasma polarization shift of ionized helium resonance
lines
A) Exp electromagnetically driven T tube
B) He II 40000-45000 K ne=2X10(17)-6X10(17)/cm(3)
C) He II resonance Line Stark broadening and shift
D) blue shifts of 0.07+-0.05A

79T 2 Gupta,U. Rajagopal,A.K.
J.Phys.B 12 L703-L709 (1979)
Plasma screening effects in the intermediate degeneracy
region
A) Theory ....
B) undefined undefined undefined
C) continuum lowering
D) consistent with the results by Stewart and
Pyatt(1966)

79T 6 Perrot,F.
Phys.Rev.A 20 586-594 (1979)
Gradient correction to the statistical electronic free
energy at nonzero temperatures; application to
equation-of-state calculations
A) Theory Thomas-Fermi model with gradient correction
B) Be, Al, Cu 0, 5, 10, 20, 50 eV n/n0=0.1, 1, 10
C) total energy, pressure, equation of state

80E 2 Tondello,G. Jannitti,E. Nicolosi,P. Santi,D.
Opt.Commun. 32 281 (1980)
Structure of the XUV emitting region in a laser produced
plasma
A) Exp Inglis - Teller merging
B) C 60-90 eV 10(20)-10(21)
C) Lyman series

80E 4 Azechi,H. Miyanaga,N. Kato,Y. Sakabe,S.
Technology Reports of The Osaka University 30 157
(1980)
Ablative Mode Compression Experiments of Spherical
Targets by Glass Laser GEKKO IV
A) Exp Stewart-Pyatt time-averaged, spherical
potential, finite-temperature T F model
B) Ne about 1keV 10(23)-10(24) e/cc
C) f-b continuum

80E 6 Pittman,T.L. Voigt,P. Kelleher,D.E.
Phys.Rev.Lett. 45 723-6 (1980)
Plasma shifts of hydrogenic-ion lines
A) Exp pulsed arc (Z discharge)
B) He II undefined ne=(1-8)X10(16)/cm(3)
C) red shift for the Paschen lines (n=4,5,6 - n=3)

80T 1 Skupsky,S.
Phys.Rev.A 21 1316 (1980)
X-ray line shift as a high-density diagnostic for laser-imploded plasmas
A) Theory by solving the Schrodinger equation for energy levels in a self-consistent potential determined by the nonlinear Poisson equation
B) Ne, Ar 500-2500eV (plasma temperature) ne=10(24)-10(26)/cm(3)
C) Ne X Lyman-Alpha line shift

80T 3 Schluter,D.
J.Quant.Spectrosc.Radiat.Transfer 23 467-472 (1980)
Debye shielding and the thermal emission of hydrogen
A) Theory Debye-Huckel potential
B) Hydrogen D=100a0 D=100a0
C) n=1-8, l=0-4 f(n',l-1 - n,l) l=1,2,3 gaunt factor(n,l), thermally averaged gaunt factor

81E 2 Nicolosi,P. Volonte,S.
J.Phys.B 14 585-590 (1981)
Polarisation shift of low-Z Balmer lines in laser-produced plasmas
A) Exp laser-produced plasma
B) C VI, N VII Te=1.2x10(16) - 2.3x10(5) K Ne=10(20) - 10(18)/cm(3)
C) shift of H-alpha line
D) no evidence for polarization shifts of the predicted magnitude (+-0.02A)

81T 1 Gupta,U. Rajagopal,A.K.
J.Phys.B 14 2309-2317 (1981)
Screening effects on the electronic states of an atom embedded in laser-imploded plasmas
A) Theory Numerical solution of the Schrodinger equation with RPA effective screened impurity potential
B) Neon 100, 750 eV (1-5)X10(24) electron/cm(3)
C) Ne+9 bound-state spectrum in electron gas

81T 3 Shalitin,D. Ron,A. Reiss,Y. Pratt,R.H.
PITT 248 ...... (1981)
Iron Plasma; Sensitivily of photoelectric cross sections to different models and general features of the Fermi-Amaldi-Modified model
A) Theory TF, FAM(Fermi-Amaldi-Modified), DHTF(Debye-Huckel-Thomas-Fermi) model
B) Fe 0.2-3 keV 50-1000 g/cc
C) binding energies photoelectric cross section
D) comparison between TF, FAM, DHTF models

81T 8 Meyer-ter-Vehn,J. Metzler,N.
MPQ(Max-Plank-Insitute fur Quantenoptik) 48 1-40 (1981)
Target Design for Heavy Ion Beam Fussion
A) Theory modified Kidder-Bodner model, stopping of heavy ions in hot dense plasma
B) Bi-ion in Pb, Li, PbLi-alloy 0 eV - 500 eV for stopping power and range. 0.1 eV - 10 KeV for pressure. npb - 0.01 npb for ionization, 10(-2) - 10(4) g/cm(3) for eq. of state for DT. 0.1 - 500 GeV for stopping power
C) HIBALL Pellet de/dr=(bound electron)+(free electron) by Nikolaev Dmitriev Zeff

81T 9 Weisheit,J.C.
PPPL 1765 1-85 (1981)
Atomic phenomena in dense plasmas
A) Theory review
B) undefined undefined undefined
C) continum lowering and level shifts f- and A- value f-f gaunt factor photoionization cross section elastic and inelastic scattering formation of spectral lines

81T10 Moore,R.M.
.... 1-105 (1981)
Atomic physics in inertial confinement fusion Part I
A) Theory review
B) undefined undefined undefined
C) continum lowering ionization nonequilibrium effects
D) surveys the existing theoretical medels for atomic ionization, equation of state

82T 1 Davis,J. Blaha,M.
J.Quant.Spectrosc.Radiat.Transfer 27 307-313 (1982)
Level shifts and inelastic electron scattering in dense plasmas
A) Theory Hartree's self-consistent field method using the Schrodinger equation with the effective potential
B) Neon 200, 500eV (1-6)X10(24) electron/cm(3)
C) Ne X Lyman-Alpha line shift at T=200, 500eV Collision strength for Ne+9 at T=200eV

82T 3 Cauble,R.
J.Quant.Spectrosc.Radiat.Transfer 28 41-46 (1982)
A model for the spectral line polarization shift in dense plasma
A) Theory semiclassical interaction model that includes the effects of perturbers exterior to the bound orbit
B) He II; Ne X, Ar XVIII in electron plasma 4eV for He II, 500-1000eV for Ne X, 1000-2000eV for Ar XVIII ne - 10(17)/cm(3) for He II, 10(24)/cm(3) for Ne X, 10(25)/cm(3) for Ar XVIII
C) plasma polarization shift

82T 9 Feng,I.J. Pratt,R.H.
J.Quant.Spectrosc.Radiat.Transfer 27 341-343 (1982)
Binding energies and bound-free transition matrix elements for an impurity atom in a hydrogen plasma
A) Theory Thomas-Fermi model;
Debye-Huckel-Thomas-Fermi model
B) Fe in hydrogen plasma 0.01-1.0 keV for energy level calculation, 0.1 keV and 1.0 keV for matrix elements calculation 10(23)/cm(3) and 10(24)/cm(3) for energy level calculation, 10(24)/cm(3) for matrix elements calculation
C) one-electron binding energies for 1s-3d electrons Bound-free transition matrix elements for 1s-np, 2s-np, 2p-nd average atomic potential

82T10 Das,M.P.
IAEA-SMR-82 27 113 (1982)
An atomic impurity in a high density plasma
A) Theory self-consistent theory based on the local density function
B) Ne Te=0 5X10(-3)-40 gm/cm(3)
C) level shifts

82T11 Adcock,Jr.J.C. Griem,H.R.
Plasma Preprint,University of Maryland PL83-024 307-313 (1982)
Plasma shifts of CVI Lyman lines to shorter wavelengths
A) Exp laser produced plasma, a nonlinear Debye-type model
B) C VI 80 eV 10(21)/cm(3)
C) Lyman series, blue shift
D) a nonlinear Debye-type model is consistent with measurement

82T14 Lee,R.W.
J.Quant.Spectrosc.Radiat.Transfer 27 249-251 (1982)
Comments on the calculation of spectral line shifts induced by plasma perturbations
A) Theory ....
B) undefined undefined undefined
C) line shift
D) Rydberg-Ritz intercombination principle which is a "single particle" approximation is inadequate.

82T15 Burgess,D.D. Lee,R.W.
Journal de Physique, Colloque C2 43 413-432 (1982)
High density plasma effects on atomic and ionic spectra
A) Theory ....
B) Ne X, Ne IX undefined undefined
C) Ionization potential depression spectrum review
D) laser produced plasma

82T17 More,R.M.
J.Quant.Spectrosc.Radiat.Transfer 27 345-357 (1982)
Electron energy-level in dense plasma
A) Theory WKB treatment of complex ions for energy level
B) Fe for energy-level, Au for ionization potential 0-1 keV 7.59g/cm(3)
C) 1s, 2s, 2p, 3s, 3p, 3d, 4s, 4p, 4f pressure ionization

82T19 Perrot,F.
Phys.Rev.A 26 1035-1041 (1982)
Temperature-dependent screening of neon in an electron gas. Application to pair-potential calculations
A) Theory Temperature-dependent local-density formalism (self-consistent)
B) Ne impurity in jellium 6-50 eV 2x10(23)/cm(3)
C) Ne(+9) bound-state spectrum

82T20 Dharma-wardana,M.W.C. Perrot,F.
Phys.Rev.A 26 2096-2104 (1982)
Density-functional theory of hydrogen plasmas
A) Theory Temperature-dependent local-density formalism (self-consistent)
B) H 3-50 eV 2.0x10(23)/cm(3)-1.6x10(24)/cm(3)
C) 1S bound-state in hydrogen plasma proton-electron, proton-proton pair-distribution functions

82T21 Perrot,F.
Phys.Rev.A. 25 489-495 (1982)
Temperature-dependent nonlinear screening of a proton in an electron gas
A) Theory Temperature-dependent local-density formalism (self-consistent)
B) H impurity in jellium 2-100 eV 2.5x10(22)/cm(3)-1.6x10(24)/cm(3)
C) H(+) 1S bound state

82T22 Hohne,F.E. Zimmermann,R.
J.Phys.B 15 2551-2561 (1982)
Oscillator strengths in dense hydrogen plasma a - no 'transparency window'
A) Theory Debye-Huckel and the cut-off Coulomb potential
B) undefined D=10a0-50a0, R(cut off Coulomb potential)=10a0-50a0 D=10a0-50a0, R=10a0-50a0
C) E(np)-E(1s) f-value for 1s-np(n=2-5) averaged oscillator strength broadened emission spectrum of the Lyman series around threshould.
D) a 'transparency window' around the threshold does not exist.

83E 1 Hashimoto,S. Yamaguchi,N.
Phys.Lett.A 95A 299 (1983)
Observation on Stark-Shifts of Lyman-Alpha Lines of Low-Z Ions in Laser Produced Plasmas
A) Exp grazing-incidence spectrograph with spatial resolution
B) Be, B, C, N, 100 eV 10(21)/cm(3)
C) Stark-Shift of Lyman-Alpha line

83T 1 Yamamoto,K. Narumi,H.
J.Phys.Soc.Japan 52 520 (1983)
High density diagnostics for laser-imploded plasmas
A) Theory plasma perturbation on the basis of an ion-sphere model
B) Ne X Te=250, 500, 1000 eV ne=1-10(25)/cm(3)
C) En (n=1-6)

83T 2 Fujimoto,K. Watanabe,T. Adachi,H.
Phys.Rev.A (submitted) .... (1983)
The analysis of electric property of extremely condensed matters by the DV-X Alpha method I. Application to cold dense neon plasma.
A) Theory Density functional method
B) Ne 0 K 1x10(22)-5x10(25) atoms/cm(3)
C) energy level for 1s-3d

68T 4 Carson,T.R. Mayers,D.F. Stibbs,D.W.N.
Mon.Not.R.Astron.Soc. 140 483-536 (1968)
The calculation of stellar radiative opacity
A) Theory Thomas-Fermi-Dirac potentials, Screened hydrogenic approximation
B) Z=1, 2, 6, 7, 8, 10, 11, 12, 13, 14, 18, 26
100-1000 eV LogPg=1.5-3.5 (Mbar)
C) b-b absorption b-f absorption stellar opacity

70T 1 Herman,L. Coulaud,G.
J.Quant.Spectrosc.Radiat.Transfer 10 1257-1275 (1970)
Integrales radiales d'un atome hydrogenoide a potentiel coulombien a ecran
A) Theory Debye-Huckel-screened hydrogenic system
B) undefined D=15-30 a0 undefined
C) dipole moment R

73T 1 Rozsnyai,B.F.
J.Quant.Spectrosc.Radiat.Transfer 13 1285 (1973)
Photoexcitation and photoionization of atoms at arbitrary temperature and matter density
A) Theory self-consistent Hartree-Fock-Slater model
B) He, Al, Cs He(0eV), Al(0-100eV), Cs(100, 1000eV)
n=0.01 n0-n0
C) excitation energies and bandwidth f-value
photoionization cross section

74T 1 Weisheit,J.C. Shore,B.W.
Astrophys.J. 194 519-523 (1974)
Plasma-screening effects upon atomic hydrogen photoabsorption
A) Theory Debye potential
B) H D(Debye length)=10a0-30a0 undefined
C) Oscillator strength df/dE Photoionization cross section

74T 2 Roussel,K.M. O'Connel,R.F.
Phys.Rev.A 9 52 (1974)
Variational solution of schrodinger's equation for the static screened coulomb potential
A) Theory screened Coulomb Potential
B) H D=5-100 a0 D=5-100 a0
C) binding energies Transition probabilities A

75T 1 Rozsnyai,B.F.
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Screening effects upon spectral line in hot matter
A) Theory Self-Consistent Hartree-Fock-Slater Average Atom Model
B) He, Li He (0, 10eV); Li (0, 2eV) He
10(-6)-10(-3) g/cc; Li 10(-5)-10(-2) n0
C) energy levels, excitation energies f-value

76T 2 Rozsnyai,B.F.
CECAM Workshop U.V. and X-ray spectra of hot and dense plasma 55-77 (1977)
Temperature and density effects on spectral lines in hot dense plasma
A) Theory Average atom model
B) Al XII, Al XIII 300 eV, 1 keV 10(20), 10(21), 10(22) ions/cm(3)
C) excitation energies f-value photoabsorption(f-f) photoabsorption(b-f) Line profile, Compton scattering
D) CECAM(Centre Europeen de Calcul Atomique et Moleculaire) Workshop Orsay, August 1 - September 30, 1976.

77E 1 Carroll,P.K. Kennedy,E.T.
Phys.Rev.Lett. 38 1068 (1977)
Doubly excited autoionization resonance in the absorption spectrum of Li+ formed in a laser-produced plasma
A) Exp laser-produced W plasma backlighting source, spatially resolved absorption spectrum
B) Li near the target surface <100 eV (estimated),20 MW laser irradiation undefined
C) f-value Fano parameter, gamma of 2s2p 1P (Li II)
D) differential oscillator strength are given df/dE=0.03eV(-1)

77T 2 Rozsnyai,B.F.
J.Quant.Spectrosc.Radiat.Transfer 17 77-88 (1977)
Spectral lines in hot dense matter
A) Theory Average atom model
B) Be, Ge plasma Be(21eV), Ge(144eV) Be 10(19)-10(21) atoms/cm(3), Ge 10(19)-10(22) atoms/cm(3)
C) excitation energies, line widths f-value photoabsorption cross section
D) An algorithm is presented for the computation of photoabsorption cross section

79T 5 Nardi,E. Zinamon,Z.
Phys.Rev.A 20 1197 (1979)
Radiative opacity of high-temperature and high-density gold
A) Theory Detailed Configuration Accounting
B) Au 750 eV Solid Density
C) absorption coefficient(f-value) absorption coefficient(f-f) absorption coefficient(b-f)

80T 3 Schluter,D.
J.Quant.Spectrosc.Radiat.Transfer 23 467-472 (1980)
Debye shielding and the thermal emission of hydrogen
A) Theory Debye-Huckel potential
B) Hydrogen D=100a0 D=100a0
C) n=1-8, l=0-4 f(n',l-1 - n,l) l=1,2,3 gaunt factor(n,l), thermally averaged gaunt factor

81T 9 Weisheit,J.C.
PPPL 1765 1-85 (1981)
Atomic phenomena in dense plasmas
A) Theory review
B) undefined undefined undefined
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82T22 Hohne,F.E. Zimmermann,R.
J.Phys.B 15 2551-2561 (1982)
Oscillator strengths in dense hydrogen plasma a - no 'transparency window'
A) Theory Debye-Huckel and the cut-off Coulomb potential
B) undefined D=10a0-50a0, R(cut off Coulomb potential)=10a0-50a0 D=10a0-50a0, R=10a0-50a0
C) E(np)-E(1s) f-value for 1s-np(n=2-5) averaged oscillator strength broadened emission spectrum of the Lyman series around threshould.
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68T 1 Carson,T.R. Hollingsworth,H.M.
Mon.Not.R.Astron.Soc. 141 77-108 (1968)
A critique of the hydrogenic approximation in the calculation of stellar opacity
A) Theory hydrogenic approximation
B) Z=1-26 10(2)-10(3) eV Pg=10(-1.5)-10(5.5) Mbar
C) energy level absorption cross section opacity

68T 4 Carson,T.R. Mayers,D.F. Stibbs,D.W.N.
Mon.Not.R.Astron.Soc. 140 483-536 (1968)
The calculation of stellar radiative opacity
A) Theory Thomas-Fermi-Dirac potentials, Screened hydrogenic approximation
B) Z=1, 2, 6, 7, 8, 10, 11, 12, 13, 14, 18, 26 100-1000 eV LogPg=1.5-3.5 (Mbar)
C) b-b absorption b-f absorption stellar opacity

73T 1 Rozsnyai,B.F.
J.Quant.Spectrosc.Radiat.Transfer 13 1285 (1973)
Photoexcitation and photoionization of atoms at arbitrary temperature and matter density
A) Theory self-consistent Hartree-Fock-Slater model
B) He, Al, Cs He(0eV), Al(0-100eV), Cs(100, 1000eV) n=0.01 n0-n0
C) excitation energies and bandwidth f-value photoionization cross section

74T 1 Weisheit,J.C. Shore,B.W.
Astrophys.J. 194 519-523 (1974)
Plasma-screening effects upon atomic hydrogen photoabsorption
A) Theory Debye potential
B) H D(Debye length)=10a0-30a0 undefined
C) Oscillator strength df/dE Photoionization cross section

76T 2 Rozsnyai,B.F.
CECAM Workshop U.V. and X-ray spectra of hot and dense plasma 55-77 (1977)
Temperature and density effects on spectral lines in hot dense plasma
A) Theory Average atom model
B) Al XII, Al XIII 300 eV, 1 keV 10(20), 10(21), 10(22) ions/cm(3)
C) excitation energies f-value photoabsorption(f-f) photoabsorption(b-f) Line profile, Compton scattering
D) CECAM(Centre Europeen de Calcul Atomique et Moleculaire) Workshop Orsay, August 1 - September 30, 1976.

77E 1 Carroll,P.K. Kennedy,E.T.
Phys.Rev.Lett. 38 1068 (1977)
Doubly excited autoionization resonance in the absorption spectrum of Li+ formed in a laser-produced plasma
A) Exp laser-produced W plasma backlighting source, spatially resolved absorption spectrum
B) Li near the target surface <100 eV (estimated),20 MW laser irradiation undefined
C) f-value Fano parameter, gamma of 2s2p 1P (Li II)
D) differential oscillator strength are given df/dE=0.03eV(-1)

77T 2 Rozsnyai,B.F.
J.Quant.Spectrosc.Radiat.Transfer 17 77-88 (1977)
Spectral lines in hot dense matter
A) Theory Average atom model
B) Be, Ge plasma Be(21eV), Ge(144eV) Be 10(19)-10(21) atoms/cm(3), Ge 10(19)-10(22) atoms/cm(3)
C) excitation energies, line widths f-value photoabsorption cross section
D) An algorithm is presented for the computation of photoabsorption cross section

78T 1 Salzman,D. Krumbein,A.
J.Appl.Phys. 49 3229 (1978)
Calculation of x-ray production rate and ionization-state density in hot aluminium plasma
A) Theory detailed configuration accounting
B) Al 15-10000eV 10(19)-10(22) a/cm(3)
C) f-b radiation ionization state and x-ray production

78T 2 Salzman,D. Wendin,G.
Phys.Rev.A 18 2695 (1978)
Calculation of photoabsorption coefficient in a hot and dense aluminum plasma
A) Theory detailed configuration accounting
B) Al 10(2)-10(5) eV 10(20)-10(22)/cm(3)
C) photoabsorption coefficient

79T 5 Nardi,E. Zinamon,Z.
Phys.Rev.A 20 1197 (1979)
Radiative opacity of high-temperature and high-density gold
A) Theory Detailed Configuration Accounting
B) Au 750 eV Solid Density
C) absorption coefficient(f-value) absorption coefficient(f-f) absorption coefficient(b-f)

80E 3 Yaakobi,H. Deckman,H. Bourke,P. Letzring,S. Soures,J.M.
Appl.Phys.Lett. 37 767 (1980)
X-ray-absorption five-structure measurement using a laser-compressed target as a source
A) Exp absorption spectra
B) sulfur neutral gypsum crystal undefined
C) Extend X-ray Absorption Fine Structure
D) near the K-edge, not analyzed yet

80T 3 Schluter,D.
J.Quant.Spectrosc.Radiat.Transfer 23 467-472 (1980)
Debye shielding and the thermal emission of hydrogen
A) Theory Debye-Huckel potential
B) Hydrogen D=100a0 D=100a0
C) n=1-8, l=0-4 f(n',l-1 - n,l) l=1,2,3 gaunt factor(n,l), thermally averaged gaunt factor

81E 1 Riordan,J.C. Pealman,J.S.
Appl.Phys.Lett. 39 543 (1981)
Extreme ultraviolet absorption spectroscopy of a backlighted aluminum plasma
A) Exp Soft x-ray irradiation of Al foil
B) Al IV, V >12 eV 0.6X10(21)/cm(3)
C) Absorption spectra (L-shell)

81T 3 Shalitin,D. Ron,A. Reiss,Y. Pratt,R.H.
PITT 248 ...... (1981)
Iron Plasma; Sensitivily of photoelectric cross sections to different models and general features of the Fermi-Amaldi-Modified model
A) Theory TF, FAM(Fermi-Amaldi-Modified), DHTF(Debye-Huckel-Thomas-Fermi) model
B) Fe 0.2-3 keV 50-1000 g/cc
C) binding energies photoelectric cross section
D) comparison between TF, FAM, DHTF models

81T 9 Weisheit,J.C.
PPPL 1765 1-85 (1981)
Atomic phenomena in dense plasmas
A) Theory review
B) undefined undefined undefined
C) continum lowering and level shifts f- and A- value f-f gaunt factor photoionization cross section elastic and inelastic scattering formation of spectral lines

82T 6 Rozsnyai,B.F.
J.Quant.Spectrosc.Radiat.Transfer 27 211-17 (1982)
An overview of the problems connected with theoretical calculations for hot plasmas
A) Theory AA model (full self-consistent Hartree-Slater type model)
B) Fe 100-10000 eV n=(10(-2)-1) n0
C) photoabsorption cross section Rosseland mean and Plank mean opacities

82T 9 Feng,I.J. Pratt,R.H.
J.Quant.Spectrosc.Radiat.Transfer 27 341-343 (1982)
Binding energies and bound-free transition matrix elements for an impurity atom in a hydrogen plasma
A) Theory Thomas-Fermi model;
Debye-Huckel-Thomas-Fermi model
B) Fe in hydrogen plasma 0.01-1.0 keV for energy level calculation, 0.1 keV and 1.0 keV for matrix elements calculation 10(23)/cm(3) and 10(24)/cm(3) for energy level calculation, 10(24)/cm(3) for matrix elements calculation
C) one-electron binding energies for 1s-3d electrons Bound-free transition matrix elements for 1s-np, 2s-np, 2p-nd average atomic potential

82T22 Hohne,F.E. Zimmermann,R.
J.Phys.B 15 2551-2561 (1982)
Oscillator strengths in dense hydrogen plasma a - no 'transparency window'
A) Theory Debye-Huckel and the cut-off Coulomb potential
B) undefined D=10a0-50a0, R(cut off Coulomb potential)=10a0-50a0 D=10a0-50a0, R=10a0-50a0
C) E(np)-E(1s) f-value for 1s-np(n=2-5) averaged oscillator strength broadened emission spectrum of the Lyman series around threshould.
D) a 'transparency wind.w' around the threshold does not exist.

** F - F Transition

REFERENCE_NO 9 RECORDS. ***

70T 3 Watson,W.D.
Astrophys.J. 159 653-658 (1970)
The influence of ion correlations on the free-free opacity of stellar interiors
A) Theory "dressed test particle" approach with frequency-independent shielding, Born approximation
B) Population I stellar composition 10(7)-10(8) K 10(2)-10(4) g/cc
C) effective inverse-bremsstrahlung cross section
D) 10% decrease in the radiative opacity caused by ion correlations

76T 2 Rozsnyai,B.F.
CECAM Workshop U.V. and X-ray spectra of hot and dense plasma 55-77 (1977)
Temperature and density effects on spectral lines in hot dense plasma
A) Theory Average atom model
B) Al XII, Al XIII 300 eV, 1 keV 10(20), 10(21), 10(22) ions/cm(3)
C) excitation energies f-value photoabsorption(f-f) photoabsorption(b-f) Line profile, Compton scattering
D) CECAM(Centre Europeen de Calcul Atomique et Moleculaire) Workshop Orsay, August 1 - September 30, 1976.

79T 1 Lima,M.B.S. Lima,C.A.S. Miranda,L.C.M.
Phys.Rev.A 19 1796-1800 (1979)
Screening effects on the plasma heating by inverse bremsstrahlung
A) Theory ....
B) undefined undefined undefined
C) f-f absorption
D) Free electron gain energy by inverse bremsstrahlung is reduced unless the laser frequency w=we (plasma frequency); in that resonance situation the absorption is enhanced.

79T 3 Rozsnyai,B.F.
J.Quant.Spectrosc.Radiat.Transfer 22 337-343 (1979)
Computation of free-free Gaunt Factors and Conductive Opacities in Hot Matter
A) Theory self-consistent temperature - and density - dependent Hartree-Slater "average atom" model
B) Cs 100, 1000eV n/n0=0.1, 1, 10, 100
C) temperature averaged f-f gaunt factor electron conductive opacities

79T 5 Nardi,E. Zinamon,Z.
Phys.Rev.A 20 1197 (1979)
Radiative opacity of high-temperature and high-density gold
A) Theory Detailed Configuration Accounting
B) Au 750 eV Solid Density
C) absorption coefficient(f-value) absorption coefficient(f-f) absorption coefficient(b-f)

80T 2 Grabbe,C.L.
Plasma Phys. 22 785-6 (1980)
Debye shielding corrections to one and two photon bremsstrahlung
A) Theory Debye shielded potential
B) undefined undefined undefined
C) bremsstrahlung cross section

81T 4 Pratt,R.H.
Comments Atom.Mol.Physics 10 121-131 (1981)
Electron bremsstrahlung spectrum
A) Theory ....
B) undefined undefined undefined
C) electron bremsstrahlung cross section
D) Review paper

81T 9 Weisheit,J.C.
PPPL 1765 1-85 (1981)
Atomic phenomena in dense plasmas
A) Theory review
B) undefined undefined undefined
C) continum lowering and level shifts f- and A- value f-f gaunt factor photoionization cross section elastic and inelastic scattering formation of spectral lines

82T 4 Lamoureux,M. Feng,I.J. Pratt,R.H. Tseng,H.K.
J.Quant.Spectrosc.Radiat.Transfer 27 227-31 (1982)
Calculation of free-free Gaunt factors for 1 keV electrons in a 1 keV normal density Ce plasma
A) Theory Average atom approximation
B) Ce 1 keV normal density
C) f-f Gaunt factors
D) Comparison with Born approxi. shows difference more than factor of 2.

78E 3 Burgess,D.D. Kolbe,G. Ward,J.M.
J.Phys.B 11 2765-2778 (1978)
Direct laser-based measurement of the collisional depopulation rate of the n=2 level of hydrogen in a plasma
A) Exp Linear pinch discharge plasma + two dye lasers
B) H Te=0.41-0.79 eV ne=(2-11)X10(14)/cm(3)
C) e-atom excitation (n=2)
D) smaller excitation rate than theory in high density

81T 2 Hatton,G.J. Lane,N.F. Weisheit,J.C.
J.Phys.B 14 4879-88 (1981)
Inelastic electron-ion scattering in a dense plasma
A) Theory Debye-Huckel model, Born approximation
B) hydrogenic ion DZ>10 a0 DZ>10 a0
C) scaled collision strength for 1s-2s, 1s-2p, 2s-2p

81T 9 Weisheit,J.C.
PPPL 1765 1-85 (1981)
Atomic phenomena in dense plasmas
A) Theory review
B) undefined undefined undefined
C) continum lowering and level shifts f- and A- value f-f gaunt factor photoionization cross section elastic and inelastic scattering formation of spectral lines

81T10 Moore,R.M.
.... 1-105 (1981)
Atomic physics in inertial confinement fusion Part I
A) Theory review
B) undefined undefined undefined
C) continum lowering ionization nonequilibrium effects
D) surveys the existing theoretical medels for atomic ionization, equation of state

82T 1 Davis,J. Blaha,M.
J.Quant.Spectrosc.Radiat.Transfer 27 307-313 (1982)
Level shifts and inelastic electron scattering in dense plasmas
A) Theory Hartree's self-consistent field method using the Schrodinger equation with the effective potential
B) Neon 200, 500eV (1-6)X10(24) electron/cm(3)
C) Ne X Lyman-Alpha line shift at T=200, 500eV
Collision strength for Ne+9 at T=200eV

82T12 Bates,D.R.
J.Phys.B 15 L755-L758 (1982)
Ion-ion recombination in an ambient ion gas
A) Theory Debye-Huckel screening
B) Kr(+), F(-), Ne(+), H3(+) 300 K 10(15)/cm(3)
C) collisional ion-ion recombination rate coefficient
D) X(+) + Y(-) + X(+)(or Y(-)) --> XY + X(+)(or Y(-))

82T17 More,R.M.
J.Quant.Spectrosc.Radiat.Transfer 27 345-357 (1982)
Electron energy-level in dense plasma
A) Theory WKB treatment of complex ions for energy level
B) Fe for energy-level, Au for ionization potential 0-1 keV 7.59g/cm(3)
C) 1s, 2s, 2p, 3s, 3p, 3d, 4s, 4p, 4f pressure ionization

82T18 Fujimoto,T. Kato,T.
Phys.Rev.Lett. 48 1022-1025 (1982)
New excitation and ionization mechanism of ions in dense plasma - the role of autoionizing state
A) Theory dielectronic-capture ladderlike excitation-ionization through CR model
B) Ne +9 Te=3.6x10(6) K ne=10(17)-10(22)/cm(3)
C) excitation and ionization rate coefficient
D) dielectronic capture into doubly excited ionic states followed by the ladderlike excitation-ionization chain

REFERENCE_NO 11 RECORDS. ***

79T 7 Clauser,M.J. Burns,E.J.T. Chang,J. Farnsworth,A.V. Goldstein,S.A. Johnson,D.J. Kuswa,G.W. Mehlhorn,T.A. Mendel,C.W. Mix,L.P. Poukey,J.W. Quintenz,J.P. Sweeney,M.A. VanDevender,J.P. Widner,M.M.
Journal de Physique, Colloque C7 40 81-85 (1979)
Particle beam interactions with plasmas and their application to inertial fusion
A) Theory ....
B) Au Cold, 200 eV, 1 keV solid density 10 MeV
C) Deposition profile of 10 MeV protons

81T 5 Nardi,E. Peleg,E. Zinamon,Z.
Appl.Phys.Lett. 39 46 (1981)
Plasma effects in the interaction of intense light ion beams with light Targets
A) Theory ....
B) Deuteron beam, CD2 targets 10 eV solid density
C) Energy deposition

81T 7 Mehlhorn,T.A.
J.Appl.Phys. 52 6522-6532 (1981)
A finite material temperature for ion energy deposition in ion-driven inertial confinement fusion target
A) Theory Bethe equation + LSS + temperature effect (bound electrons + free electrons)
B) Al, Au, C, Br, Xe, U for charge states, P, C, Xe, U for stopping power 10 - 100 eV for electron tempe. 0 - 1000 eV for range stopping power. ne=0.0001 - 1.0 n0 (solid density) 0 - 40 MeV
C) Bethe, LSS and Nuclear stopping power effective charge by Brown-Moak
D) dE/dx by free-electrons and bound electrons energy deposition profile, range shortening in heated material

81T 8 Meyer-ter-Vehn,J. Metzler,N.
MPQ(Max-Plank-Insitute fur Quantenoptik) 48 1-40 (1981)
Target Design for Heavy Ion Beam Fussion
A) Theory modified Kidder-Bodner model, stopping of heavy ions in hot dense plasma
B) Bi-ion in Pb, Li, PbLi-alloy 0 eV - 500 eV for stopping power and range. 0.1 eV - 10 KeV for pressure. npb - 0.01 npb for ionization, 10(-2) - 10(4) g/cm(3) for eq. of state for DT. 0.1 - 500 GeV for stopping power
C) HIBALL Pellet de/dr=(bound electron)+(free electron) by Nikolaev Dmitriev Zeff

82E 2 Geissel,H. Laichter,Y. Schneider,W.F.W. Armbruster,P.
Proceedings of the Symposium on Accelerator Aspects of Heavy Ion Fusion GSI-82-8 578-584 (1982)
Stopping Powers and Ranges of (0.1-2.4) GeV Uranium Ions in Solids
A) Exp time-of-flight spectrometer
B) (238)U ions in C, Al, Ni, Sn, Au undefined undefined 0.1-2.4 GeV, 0.5-10.0 MeV/amu
C) S(E)=a1 + a2*lnE + a3*E**(1/2) + a4*E**(2)
D) Ranges (mg/cm(2)) of (238)U in C, Al, Ni, Sn and Au for the energy region (0.5-10) MeV/amu are measured.

82E 3 Young,F.C. Mosher,D. Stephanakis,S.J. Goldstein,S.A. Mehlhorn,T.A.
Phys.Rev.Lett. 49 549 (1982)
Measurements of Enhanced Stopping of 1 MeV Deuterons in Target-Ablation Plasmas
A) Exp D-D neutron TOF, Double foil CD2 Targets
B) Deutron beam CD2 Target 3-17 eV solid
C) Enhanced Energy Deposition

82T 7 Maynard,G. Deutsch,C.
Phys.Rev.A 26 665-668 (1982)
Energy loss and straggling of ions with any velocity in dense plasmas at any temperature
A) Theory Randam-Phase-Approximation(RPA) dielectronic function
B) undefined undefined 10(25)-10(29) ne/cm(3)
C) stopping power and straggling
D) Temperature effect is significant at low velocity

82T 8 McGuire,E.J.
Phys.Rev.A 26 1871-82 (1982)
Stopping power of some lightly ionized gold ions for photons
A) Theory DWBA (Bethe)
B) Au(n+) (n=0-11) undefined energy range; 0.1-10 MeV proton
C) stopping power

82T13 Meyer-ter-Vehn,J.
MPQ (Max-Plank-Insitute fur Quantenoptik) 64 1-29 (1982)A
ICF-Target Studies for Heavy Ion Fusion
A) Theory Kidder-Bodner model. 1 dimensional target calculations for HIBALL
B) (209)(83)Bi - (208)Pb, (7)(3)Li, PbLi 50 - 500 eV for range 10(-1) - 2x10(2) g/cm(2) for 10 GeV incident Bi-ion 0.1 - 100 GeV for range
C) (209)(83)Bi - (208)Pb, (7)(3)Li, PbLi gain for reactor target

82T23 Deutsch,C. Maynard,G. Minoo,H.
Proceedings of the Symposium on Accelerator Aspects of Heavy Ion Fusion GSI-82-8 543-570 (1982)
Ions Stopping in Dense and Hot Matter
A) Theory Stopping Power using dielectric function
B) undefined Te=0.768 - Te=2.3607 (T=1.51x10(6)K - 4.68x10(6)K) 10(25)/cm(3) 0.1-100 MeV/amu
C) stopping power calculated from energy loss late

83E 2 Ozaki,T. Miyamoto,S. Ogawa,F. Yoshinouchi,A. Imasaki,K. Nakai,S. Yamanaka,C.
J.Appl.Phys. 54 632-635 (1983)
Measurements of the energy deposition profiles of an intense light ion beam in target using neutron time-of-flight
A) Exp ....
B) Deuteron beam, CD2 target 2 eV solid density
C) Energy deposition profile

** Others

REFERENCE_NO 34 RECORDS. ***

53T 1 Tomishima,Y. Umeda,K.
J.Phys.Soc.Japan 8 360-364 (1953)
TFD Functions for Non-zero Temperatures and Equations of State Based on Them
A) Theory Thomas-Fermi-Dirac model
B) Fe 20000 K 10.592, 59.947, 67.261 g/cm(3)
C) density-pressure diagram

53T 2 Tomishima,Y. Umeda,K.
Res.Not.Dept.Phys.Okayama Univ. No.6 1-15 (1953)
A Table of the TFD Function for Non-zero Temperature (I) Fe, T=20000
A) Theory Thomas-Fermi-Dirac model
B) Fe 20000 K 10.592, 59.947, 67.261 g/cm(3)
C) TFD function
D) A supplement to 53T1 (J.Phys.Soc.Japan 8,360 (1953))

58T 1 Cowan,R.D. Kirkwood,J.G.
J.Chem.Phys. 29 264-271 (1958)
Quantum Statistical Theory of Plasmas and Liquid Metals
A) Theory Debye-Huckel-Thomas-Fermi model; Thomas-Fermi model
B) Fe 1-10(3) eV n/n0=0.1-10
C) pressure-temperature relation, the radial distribution of electrons and nuclei
D) The most fundamental literature on the DHTF model

62E 1 Berg,H.F. Ali,A.W. Lincke,R. Griem,H.R.
Phys.Rev. 125 199-206 (1962)
Measurement of Stark profiles of neutral and ionized helium and hydrogen lines from shock-heated plasmas in electromagnetic T tubes
A) Exp shock tubes
B) H, He, He II 1-5 eV ne=10(17)/cm(3)
C) shift line profile
D) He II 4686A blue-shift (polarization of plasma)

68T 1 Carson,T.R. Hollingsworth,H.M.
Mon.Not.R.Astron.Soc. 141 77-108 (1968)
A critique of the hydrogenic approximation in the calculation of stellar opacity
A) Theory hydrogenic approximation
B) Z=1-26 10(2)-10(3) eV Pg=10(-1.5)-10(5.5) Mbar
C) energy level absorption cross section opacity

68T 2 Zink,J.W.
Phys.Rev. 176 279-284 (1968)
Shell structure and Thomas-Fermi equation of state
A) Theory Thomas-Fermi shell model
B) Fe, Li Fe 770 eV, Li 4.32 eV 0.1-10(5) g/cc
C) equation of state
D) model potential with properties like Thomas Fermi that can be used to determine shell structure in dense, partially ionized matter

68T 4 Carson,T.R. Mayers,D.F. Stibbs,D.W.N.
Mon.Not.R.Astron.Soc. 140 483-536 (1968)
The calculation of stellar radiative opacity
A) Theory Thomas-Fermi-Dirac potentials, Screened hydrogenic approximation
B) Z=1, 2, 6, 7, 8, 10, 11, 12, 13, 14, 18, 26
100-1000 eV LogPg=1.5-3.5 (Mbar)
C) b-b absorption b-f absorption stellar opacity

72T 1 Rozsnyai,B.F.
Phys.Rev.A 5 1137 (1972)
Relativistic Hartree-Fock-Slater calculations for arbitrary temperature and matter density
A) Theory AA model (The self consistent-field treatment with relativistic Thomas-Fermi-Dirac model)
B) Fe(26), Rb(37) 0, 100 eV n=0.1n0, n0, 20n0
C) Energy levels and populations electron pressure
D) An algorithm to calculate electronic levels and the equation of state of atoms is presented

75T 2 Magee,N.H. Merts,A.L. Heubuer,W.F.
Astrophys.J. 196 617 (1975)
Improved opacity calculations
A) Theory narrow-line approximation
B) astrophysical mixture 5X10(7)-10(9) K
10(-1)-10(10) g/cm(3)
C) Rosseland mean opacities

76E 1 Vanzandt,J.R. Adcock,J.C. Griem,H.R.
Phys.Rev.A 14 2126-2132 (1976)
Shift and width measurements of the Stark-broadened ionized helium line at 1215A
A) Exp electromagnetic shock tube
B) He II about 3 eV about 2X10(17)/cm(3)
C) shifts of He II 1640, 1215A stark profile
D) 1215A (n=4-2) red shift of less than 0.5A (consistent with semiclassical estimate of plasma polarization shift)

76T 1 Rozsnyai,B.F. Alder,B.J.
Phys.Rev.A 14 2295-2300 (1976)
Quantum-statistical models for multicomponent plasmas
A) Theory Thomas-Fermi-Dirac model; Debye-Huckel-Thomas-Fermi-Dirac model
B) H-Fe mixture 10, 500, 300, 1000 eV undefined
C) electron chemical potential, electron density and potential at cell boundery, charge and potential distributions Gibbs potential
D) Pressure; P=2,10,10(2) (Mbar) for T=10 eV, P=10(5) (Mbar) for T=0.5,0.8,1.0 KeV, P=3X10(5) (Mbar) for 1.0 KeV

76T 2 Rozsnyai,B.F.
CECAM Workshop U.V. and X-ray spectra of hot and dense plasma 55-77 (1977)
Temperature and density effects on spectral lines in hot dense plasma
A) Theory Average atom model
B) Al XII, Al XIII 300 eV, 1 keV 10(20), 10(21), 10(22) ions/cm(3)
C) excitation energies f-value photoabsorption(f-f) photoabsorption(b-f) Line profile, Compton scattering
D) CECAM(Centre Europeen de Calcul Atomique et Moleculaire) Workshop Orsay, August 1 - September 30, 1976.

77T 3 Rozsnyai,B.F.
Phys.Rev.A 16 1687-1691 (1977)
Quantum-statistical models for multicomponent plasmas II.
A) Theory Debye-Huckel-Thomas-Fermi-Dirac model
B) Fe-H mixture 10 eV-10 keV undefined
C) Gibbs potential
D) pressure range 2 Mbar-10(2) Mbar

78E 1 Pergudov,G.V. Ragozin,E.N.
Sov.Phys.-JETP Lett 28 26 (1978)
Photographs of laser plume in line radiation of multiply charged ions in the far vacuum ultraviolet
A) Exp registration of photographs of a laser plasma with two-coordinate spatial resolution
B) Ca XIII, XVI undefined undefined
C) spatially change of Doppler broadening

78T 1 Salzman,D. Krumbein,A.
J.Appl.Phys. 49 3229 (1978)
Calculation of x-ray production rate and ionization-state density in hot aluminium plasma
A) Theory detailed configuration accounting
B) Al 15-10000eV 10(19)-10(22) a/cm(3)
C) f-b radiation ionization state and x-ray production

79T 3 Rozsnyai,B.F.
J.Quant.Spectrosc.Radiat.Transfer 22 337-343 (1979)
Computation of free-free Gaunt Factors and Conductive Opacities in Hot Matter
A) Theory self-consistent temperature - and density - dependent Hartree-Slater "average atom" model
B) Cs 100, 1000eV n/n0=0.1, 1, 10, 100
C) temperature averaged f-f gaunt factor electron conductive opacities

79T 4 Burgess,D.D. Everett,D. Lee,R.W.
J.Phys.B 12 L755 (1979)
Suppression of Doppler broadening for XUV transitions in dense plasmas
A) Theory Numerical estimates emitter mean free path based on a collisional-radiative model
B) Z=1-29 50, 200, 1000 eV 2X10(21)/cm(3)
C) suppression of doppler broadening
D) Authors point out that the experimental evidence of this effect was shown in the paper Sov.Phys.-JETP Lett 28, 26 (1978) by Pergudov,G.V. and Ragozin,E.N.

79T 6 Perrot,F.
Phys.Rev.A 20 586-594 (1979)
Gradient correction to the statistical electronic free energy at nonzero temperatures; application to equation-of-state calculations
A) Theory Thomas-Fermi model with gradient correction
B) Be, Al, Cu 0, 5, 10, 20, 50 eV n/n0=0.1, 1, 10
C) total energy, pressure, equation of state

80E 1 Yaakobi,B. Skupsky,S. Mccrory,R.L. Hooper,C.F. Deckman,H. Bourke,P. Soures,J.M.
Phys.Rev.Lett. 44 1072 (1980)
Symmetric Laser Compression of Argon-Filled Glass Shells to Densities of 4-6 g/cm(3)
A) Exp x-ray spectroscopy of laser-compressed target
B) Ar16+ 800 eV 10(24)/cm(3)
C) spectral profile change with density

80E 5 Neiger,M. Zimmermann,B.
J.Quant.Spectrosc.Radiat.Transfer 23 241 (1980)
Broadening of free-bound radiation thresholds in plasmas - I. Experimental investigation for Cl(-)Br(-) and I(-)
A) Exp electric diplole interaction, electric plasma microfield
B) Cl, Br, I 6500-8500 K 2X10(15)-10(16) e/cc
C) affinity continuum
D) photo detachment cross section

81T 6 Feng,I.J. Zakowicz,W. Pratt,R.H.
Phys.Rev.A 23 883-886 (1981)
Problems in estimating average degree of ionization for high-temperature dense plasmas
A) Theory Thomas-Fermi model; Debye-Huckel-Thomas-Fermi model
B) H 1-1000 eV 10(23)/cm(3)
C) average degree of ionization
D) See also Zakowicz,W. et al, J.Quant.Spectrosc.Radiat.Transfer.27,329(1982)=(82T5)

81T 9 Weisheit,J.C.
PPPL 1765 1-85 (1981)
Atomic phenomena in dense plasmas
A) Theory review
B) undefined undefined undefined
C) continum lowering and level shifts f- and A- value f-f gaunt factor photoionization cross section elastic and inelastic scattering formation of spectral lines

81T10 Moore,R.M.
.... 1-105 (1981)
Atomic physics in inertial confinement fusion Part I
A) Theory review
B) undefined undefined undefined
C) continum lowering ionization nonequilibrium effects
D) surveys the existing theoretical medels for atomic ionization, equation of state

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Dielectronic satellite spectra from dense laser-produced plasmas
A) Exp laser produced plasma
B) C V, Si XIII, S XV, Ar XVII 50 eV for C V, 450 eV for Si XIII 8x10(19)-2x10(20)/cm(3) for CV, 10(22)-2x10(23)/cm(3) for Si XIII
C) Ly alpha, 2p2(3P)-1s2p(3P) satellite line

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Statistical Mechanics of 'Atoms' in Hot, Partially Ionized Matter, The Theory of the One Electron Green Function
A) Theory one-electron green function
B) arbitrary coupling parameter, gamma<1, =3, >3 arbitrary
C) statistical thermodynamics and transport properties, charge distribution around the impurity ion

82T 5 Zakowicz,W. Feng,I.J. Pratt,R.H.
J.Quant.Spectrosc.Radiat.Transfer 27 329-33 (1982)
Problems in the use of statistical average atom potentials for estimating average degree of ionization
A) Theory Thomas-Fermi model dnd Debye-Huckel-Thomas-Fermi average atom model
B) H 10(3)-10(7) K 10(23)-10(25) /cc
C) average degree of ionization;average atomic potential
D) See also Phys.Rev.A 23,883(1981)

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An overview of the problems connected with theoretical calculations for hot plasmas
- A) Theory AA model (full self-consistent Hartree-Slater type model)
- B) Fe 100-10000 eV n=(10(-2)-1) n0
- C) photoabsorption cross section Rosseland mean and Plank mean opacities

82T 9 Feng,I.J. Pratt,R.H.
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Binding energies and bound-free transition matrix elements for an impurity atom in a hydrogen plasma
- A) Theory Thomas-Fermi model; Debye-Huckel-Thomas-Fermi model
- B) Fe in hydrogen plasma 0.01-1.0 keV for energy level calculation, 0.1 keV and 1.0 keV for matrix elements calculation 10(23)/cm(3) and 10(24)/cm(3) for energy level calculation, 10(24)/cm(3) for matrix elements calculation
- C) one-electron binding energies for 1s-3d electrons Bound-free transition matrix elements for 1s-np, 2s-np, 2p-nd average atomic potential

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- A) Theory Kidder-Bodner model. 1 dimensional target calculations for HIBALL
- B) (209)(83)Bi - (208)Pb, (7)(3)Li, PbLi 50 - 500 eV for range 10(-1) - 2x10(2) g/cm(2) for 10 GeV incident Bi-ion 0.1 - 100 GeV for range
- C) (209)(83)Bi - (208)Pb, (7)(3)Li, PbLi gain for reactor target

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- A) Theory ....
- B) Ne X, Ne IX undefined undefined
- C) Ionization potential depression spectrum review
- D) laser produced plasma

82T16 Gupta,U. Rajagopal,A.K.
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Density functional formalism at finite temperatures with some applications
- A) Theory A density functional theory of inhomogeneous electron systems at finite temperatures
- B) Ne 100 eV ne=10(24)/cm(3)
- C) review

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A) Theory Temperature-dependent local-density formalism (self-consistent)
B) H 3-50 eV 2.0x10(23)/cm(3)-1.6x10(24)/cm(3)
C) 1S bound-state in hydrogen plasma proton-electron, proton-proton pair-distribution functions

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B) undefined D=10a0-50a0, R(cut off Coulomb potential)=10a0-50a0 D=10a0-50a0, R=10a0-50a0
C) E(np)-E(1s) f-value for 1s-np(n=2-5) averaged oscillator strength broadened emission spectrum of the Lyman series around threshould.
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A) Theory the time dependent charge state of a heavy, average-atom model
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