

C INPUT : (R*8) ZEFF = EFFECTIVE ION CHARGE.
C INPUT : (R*8) BMAG = PLASMA MAGNETIC INDUCTION.
C UNITS: TESLA
C INPUT : (R*8) BMENG = BEAM ENERGY.
C UNITS: EV/AMU
C INPUT : (I*4) ITHEOR = CHARGE EXCHANGE MODEL OPTION.
C 1 => USE INPUT DATA SET.
C 2 => USE EIKONAL MODEL.
C INPUT : (I*4) IBSTAT = DONOR STATE FOR EIKONAL MODEL.
C 1 => H(1S)
C 2 => H(2S)
C 3 => H(2P)
C 4 => HE(1S2)
C 5 => HE(1S2S)
C INPUT : (I*4) IEMMS = EMISSION MEASURE MODEL OPTION.
C 1 => CHARGE EXCHANGE.
C 2 => ELECTRON IMPACT EXCITATION.
C INPUT : (I*4) NTL = LOWER PRINCIPAL QUANTUM NUMBER OF
C TRANSITION.
C INPUT : (I*4) NTU = UPPER PRINCIPAL QUANTUM NUMBER OF
C TRANSITION.
C INPUT : (I*4) NMINF = LOWEST N-SHELL FOR WHICH DATA READ.
C INPUT : (I*4) NMAXF = HIGHEST N-SHELL FOR WHICH DATA READ.
C INPUT : (I*4) NENRGY = NUMBER OF ENERGIES READ FROM DATA SET.
C INPUT : (R*8) ENRGYA() = COLLISION ENERGIES READ FROM INPUT DATA
C SET.
C UNITS: EV/AMU
C DIMENSION: ENERGY INDEX
C INPUT : (R*8) ALPHAA() = EXTRAPOLATION PARAMETER ALPHA READ FROM
C INPUT DATA SET.
C DIMENSION: ENERGY INDEX
C INPUT : (R*8) XSECNA(,) = N-RESOLVED CHARGE EXCHANGE CROSS-SECTIONS
C READ FROM INPUT DATA SET.
C UNITS: CM2
C 1ST DIMENSION: ENERGY INDEX
C 2ND DIMENSION: N-SHELL
C INPUT : (R*8) FRACLA(,) = L-RESOLVED CHARGE EXCHANGE CROSS-SECTIONS.
C AFTER CXDATA: ABSOLUTE VALUES (CM2).
C AFTER CXFRAC: FRACTION OF N-RESOLVED
C DATA.
C 1ST DIMENSION: ENERGY INDEX
C 2ND DIMENSION: INDEXED BY I4IDFL(N,L)
C
C OUTPUT: (R*8) ERATE = EFFECTIVE EMISSIVITY RATE COEFFICIENT FOR
C REQUESTED TRANSITION
C SPECTRUM LINE.
C UNITS: CM3 SEC-1
C
C PARAM : (I*4) MXN = MXNSHL.
C PARAM : (I*4) MXJSHL = MAXIMUM NUMBER OF J SUB-SHELLS.
C PARAM : (I*4) MXBEAM = MAXIMUM NUMBER OF BEAM COMPONENTS.
C PARAM : (I*4) MXOBSL = MAXIMUM NUMBER OF OBSERVED SPECTRUM
C LINES.

C
C PARAM : (I*4) MXPRSL = MAXIMUM NUMBER OF SPECTRUM LINES TO
C PREDICT.
C
C PARAM : (R*8) EMP = REDUCED MASS FOR POSITIVE ION.
C UNITS: ELECTRON MASSES
C
C (I*4) NBEAM = NUMBER OF BEAM ENERGIES.
C (I*4) NOLINE = NUMBER OF OBSERVED SPECTRUM LINES.
C (I*4) NPLINE = NUMBER OF SPECTRUM LINES TO PREDICT.
C (I*4) NUMIN = MINIMUM UPPER PRINCIPAL QUANTUM NUMBER
C FOR OBSERVED SPECTRUM LINES.
C (I*4) NUMAX = MAXIMUM UPPER PRINCIPAL QUANTUM NUMBER
C FOR OBSERVED SPECTRUM LINES.
C
C (R*8) EM = EMISSION MEASURE.
C UNITS: CM-5
C
C (I*4) NL () = LIST OF LOWER PRINCIPAL QUANTUM NUMBERS
C OF OBSERVED SPECTRUM LINES.
C DIMENSION: SPECTRUM LINE INDEX.
C (I*4) NU () = LIST OF UPPER PRINCIPAL QUANTUM NUMBERS
C OF OBSERVED SPECTRUM LINES.
C DIMENSION: SPECTRUM LINE INDEX.
C (I*4) NPL () = LIST OF LOWER PRINCIPAL QUANTUM NUMBERS
C OF SPECTRUM LINES TO PREDICT.
C DIMENSION: SPECTRUM LINE INDEX.
C (I*4) NPU () = LIST OF UPPER PRINCIPAL QUANTUM NUMBERS
C OF SPECTRUM LINES TO PREDICT.
C DIMENSION: SPECTRUM LINE INDEX.
C
C (R*8) BMFRA () = BEAM COMPONENT FRACTIONS.
C DIMENSION: COMPONENT INDEX.
C (R*8) BMENA () = BEAM ENERGY COMPONENTS.
C UNITS: EV/AMU
C (R*8) EMISA () = LIST OF EMISSIVITIES OF OBSERVED SPECTRUM
C LINES.
C UNITS: PH CM-2 SEC-1
C DIMENSION: SPECTRUM LINE INDEX.
C (R*8) TBLF () = TABLE OF RADIATIVE LIFETIMES.
C UNITS: SECS
C DIMENSION: REFERENCED BY I4IDFL(N,L) .
C (R*8) TBQEX () = MEAN EXCITATION RATE COEFFICIENTS FOR
C NL-LEVELS AVERAGED OVER BEAM FRACTIONS.
C UNITS: CM3 SEC-1
C DIMENSION: REFERENCED BY I4IDFL(N,L) .
C (R*8) QTHEX () = MEAN EXCITATION RATE COEFFICIENTS FOR
C N-LEVELS AVERAGED OVER BEAM FRACTIONS.
C UNITS: CM3 SEC-1
C DIMENSION: N SHELL INDEX.
C (R*8) FTHEX () = FRACTION OF N-LEVEL MEAN EXCITATION RATE
C COEFFICIENTS IN NL-LEVEL.
C DIMENSION: REFERENCED BY I4IDFL(N,L) .

C (R*8) QTHCH () = MEAN CHARGE EXCHANGE COEFFICIENTS FOR
 C N-LEVELS AVERAGED OVER BEAM FRACTIONS.
 C UNITS: CM3 SEC-1
 C DIMENSION: N SHELL INDEX.
 C (R*8) FTHCH () = FRACTION OF N-LEVEL MEAN CHARGE EXCHANGE
 C COEFFICIENTS IN NL-LEVEL.
 C DIMENSION: REFERENCED BY I4IDFL(N,L).
 C (R*8) TBQMEP () = ELECTRON COLLISIONAL RATE COEFFT. FOR
 C NL->NL+1.
 C DIMENSION: REFERENCED BY I4IDFL(N,L).
 C (R*8) TBQMEM () = ELECTRON COLLISIONAL RATE COEFFT. FOR
 C NL->NL-1.
 C DIMENSION: REFERENCED BY I4IDFL(N,L).
 C (R*8) TBQMIP () = POSITIVE ION COLLISIONAL RATE COEFFT. FOR
 C NL->NL+1.
 C DIMENSION: REFERENCED BY I4IDFL(N,L).
 C (R*8) TBQMIM () = POSITIVE ION COLLISIONAL RATE COEFFT. FOR
 C NL->NL-1.
 C DIMENSION: REFERENCED BY I4IDFL(N,L).
 C (R*8) QEX () =
 C DIMENSION: N SHELL INDEX.
 C (R*8) TOTPOP () = TOTAL COLLISION POP. FOR PREDICTED
 C SPECTRUM LINE.
 C UNITS: CM-2
 C DIMENSION: PREDICTED LINE INDEX.
 C (R*8) TOTEMI () = TOTAL COLLISION EMISSIVITIES FOR PREDICTED
 C SPECTRUM LINE.
 C UNITS: PH CM-2 SEC-1
 C DIMENSION: PREDICTED LINE INDEX.
 C (R*8) AVRGWL () = AVERAGE AIR WAVELENGTH FOR PREDICTED
 C SPECTRUM LINE.
 C UNITS: A
 C DIMENSION: PREDICTED LINE INDEX.
 C (R*8) QEFF () = EFF. RATE COEFFICIENT FOR PREDICTED
 C SPECTRUM LINE.
 C UNITS: CM3 SEC-1
 C DIMENSION: PREDICTED LINE INDEX.
 C
 C (R*8) TBLPOP (,) = TABLE OF COLLISION POP. FOR PREDICTED
 C SPECTRUM LINE.
 C UNITS: CM-2
 C 1ST DIMENSION: PREDICTED LINE INDEX.
 C 2ND DIMENSION: REFERENCED BY I4IDLI () .
 C (R*8) TBLEMI (,) = TABLE OF COLLISION EMISSIVITIES FOR
 C PREDICTED SPECTRUM LINE.
 C UNITS: PH CM-2 SEC-1
 C 1ST DIMENSION: PREDICTED LINE INDEX.
 C 2ND DIMENSION: REFERENCED BY I4IDLI () .
 C (R*8) TBLWLN (,) = TABLE OF WAVELENGTHS FOR PREDICTED
 C SPECTRUM LINE.
 C UNITS: A
 C 1ST DIMENSION: PREDICTED LINE INDEX.
 C 2ND DIMENSION: REFERENCED BY I4IDLI () .

