CHIANTI

An Atomic Database for Spectroscopic Diagnostics of Astrophysical Plasmas.

Naval Research Laboratory (USA) - Rutherford Appleton Laboratory (UK) - University College London - MSSL (UK)
University of Cambridge (UK) - George Mason University (USA) - Universita' degli Studi di Firenze (Italy)

Fe XXIII - VERSION 5.2

The CHIANTI database consists of the following primary ASCII files for this ion:

1. fe_23.elvlc (energy levels)

contains the energy levels in cm^(-1) It includes both experimental and theoretical values of the levels energies.

```
%observed energies (n=2,3,4): Del Zanna, Chidichimo, Mason, 2005, A&A, 432, 113
%observed energy levels (n=5): Shirai,T., et al, 2000, J.Phys.Chem.Ref.Data, Mo
%observed energy levels (97,100): Landi & Phillips 2005, ApJ, in press
%observed energy levels (above ionization): Palmeri P., Mendoza C., Kallman T.R
%theoretical energies (levels 1-98, second column): Del Zanna, Mason, 2005, A&A
%theoretical energies (levels 1-98, third column): Del Zanna, Mason, 2005, A&A,
    with term energy corrections)
%Theoretical energy levels (99-166): Landi & Gu, 2005, ApJ, in press
%theoretical energy levels (above ionization): Bautista, M.A., Mendoza, C., Kal
%Comment: the theoretical energies from Palmeri et al. have been used as experi
%produced as part of the Arcetri/Cambridge/NRL 'CHIANTI' atomic data base colla
%
%   G. Del Zanna and E. Landi - June 23 2005
```

2. fe_23.wgfa (radiative data)

contains wavelengths, gf and A values of the transitions. The wavelengths are based on the experimental energy levels and should be the best available. Wavelengths calculated from the theoretical energies are of an indeterminate accuracy and their values are presented as negative values of the calculated wavelength.

```
%observed energies (n=2,3,4): Del Zanna, Chidichimo, Mason, 2005, A&A, 432, 113
%observed energy levels (n=5): Shirai,T., et al, 2000, J.Phys.Chem.Ref.Data, Mo
%observed energy levels (97,100): Landi & Phillips 2005, ApJ, in press
%observed energy levels (above ionization): Palmeri P., Mendoza C., Kallman T.R
%theoretical energies levels (1-98): Del Zanna, Mason, 2005, A&A, 430, 331 (SUP
%Theoretical energy levels (99-166): Landi & Gu, 2005, ApJ, in press
```

```
%A and gf values (1-98): Del Zanna, Chidichimo, Mason, 2005, A&A, 432, 1137
%A and gf values (99-166): Landi & Gu, 2005, ApJ, in press
%Radiative data (above ionization): Palmeri P., Mendoza C., Kallman T.R., Bauti
%Autoionization rates: Palmeri P., Mendoza C., Kallman T.R., Bautista M.A., 200
%produced as part of the Arcetri/Cambridge/NRL 'CHIANTI' atomic data base colla
%
%  G. Del Zanna and E. Landi - June 23 2005
```

3. fe_23.splups (electron collision data)

contains the spline fits to the electron collision strengths scaled according the rules formulated by Burgess and Tully (1992). Accurate replication of the temperature averaged collision strength over a wide range of temperatures can be accomplished with the data in this file.

```
%filename: fe_23.splups
%oscillator strengths (levels 1-98): Del Zanna, Mason, 2005, A&A, 430, 331 (sca
%oscillator strengths (levels 99-166): Landi & Gu, 2005, ApJ, in press
%oscillator strengths (above ionization): Bautista, M.A., Mendoza, C., Kallman,
%effective Collision strengths (levels 1-98): Chidichimo, Del Zanna, Mason, 200
%collision strengths (levels 99-166): Landi & Gu, 2005, ApJ, in press
%collisional data (above ionization): Bautista, M.A., Mendoza, C., Kallman, T.R
%comment: Effective collision strengths from Chidichimo et al 2005 were calcula
%produced as part of the Arcetri/Cambridge/NRL 'CHIANTI' atomic data base colla
%
%    G.Del Zanna and E. Landi - Jun 23, 2005
```

4. fe_23.psplups (proton collision data)

contains the spline fits to the scaled proton collision strengths.

```
%filename: fe_23.psplups
%rates: Ryans R.S.I., Foster-Woods V.J, Copeland F., Keenan F.P., Matthews A.,
%energies: CHIANTI database, ver.1, Dere et al., A&AS 125, 149, 1997
%comment: Fits valid for temperatures 4e6 to 3e8 K.
%produced as part of the Arcetri/Cambridge/NRL 'CHIANTI' atomic data base colla
%
% Peter Young  24-Oct-00
```

5. fe_23.reclvl (total recombination population rates)

```
%filename: fe_23.reclvl
%Total recombination population rate: Gu, M.F., 2003, ApJ, 582, 1241
%produced as part of the Arcetri/Cambridge/NRL 'CHIANTI' atomic data base colla
%
% Enrico Landi - Feb 2004
```

6. fe_23.cilvl (collisional ionization population rates)

```
%filename: fe_23.cilvl
%Collisional ionization population rate: Gu, M.F., 2003, ApJ, 582, 1241
%produced as part of the Arcetri/Cambridge/NRL 'CHIANTI' atomic data base colla
%
% Enrico Landi - Feb 2004
```

The html tables below contain the radiative data of the brightest lines sorted in wavelength

- **fe_23_table1.html (html table -- 7.4720 -- 33.2442 A)**
- **fe_23_table2.html (html table -- 33.3195 -- 1079.4143 A)**

Last revised by G. Del Zanna on 14-Mar-2006