VIII SERBIAN CONFERENCE ON SPECTRAL LINE SHAPES IN ASTROPHYSICS
6-10 June 2011, Divčibare, Serbia
Book of Abstracts, Eds. L. Č. Popović, D. Jevremović and D. Ilić
Astronomical Observatory Belgrade, 2011

*Poster*

# CROSS SECTIONS FOR ELECTRON IMPACT EXCITATION OF O VI LINES

**H. Elabidi[1], S. Sahal-Bréchot[2] and N. Ben Nessib[3]**

[1] *Groupe de Recherche en Physique Atomique et Astrophysique, Faculte des Sciences de Bizerte,Univ. Carthage, Tunisia*
[2] *Observatoire de Paris, LERMA, CNRS, UMR 8112, 5 Place Jules Janssen, 92190 Meudon, France*
[3] *Groupe de Recherche en Physique Atomique et Astrophysique, INSAT, Tunis, Univ. Carthage, Tunisia*

*E-mail: haykel.elabidi@fsb.rnu.tn*

For some astrophysical and laboratory plasmas, an important process responsible for line emission is the electron impact excitation of highly charged ions. Transitions in O VI have been observed in stellar spectra, in white dwarfs, in the solar corona, and in the solar transition region, where the two resonance lines at 1031.924 Å and 1037.614 Å are among the brightest emitted. The knowledge of the excitation cross sections for this ion is very important for the spectroscopic diagnostics. In this work, the distorted wave approach has been used to calculate electron impact excitation cross sections for the $2s-2p$ transitions in O VI and collision strengths for transitions among the fine structure levels belonging to the $1s^2nl$ ($l \leq 5$) configurations.

The atomic structure has been computed using the UCL (University College, London) computer package SUPERSTRUCTURE (SST). This code takes into account configuration interaction, where each individual configuration is an expansion in terms of Slater states built from orthonormal orbitals. Relativistic corrections (spin-orbit, mass, Darwin and one-body) are introduced according to the Breit-Pauli approach as a perturbation to the non-relativistic Hamiltonian. The electron scattering calculation has been performed in the distorted wave approximation using the UCL-DISTORTED WAVE (DW) code. Fine structure collision parameters have been obtained by the UCL-JAJOM code through the transformation of the $LS$ transition matrix elements into $LSJ$ ones using Term Coupling Coeficients given by the SST code.

In our knowledge, there are no results for electron impact excitation cross sections for O VI using the distorted wave method. Our cross sections in the excitation threshold region of the O VI $2s-2p$ transitions have been compared to experimental and to R-matrix ones. Our fine structure collision strengths at energies below 63 Ry have been compared to the Dirac Atomic R-matrix Code (DARC) results.