

Photoexcitation of He-like $2s2p \ ^1P_1$ from $1s^2 \ ^1S_0$: radiative and autoionization decays.

Oleg Zabaydullin^{1,2} and Jacques Dubau³

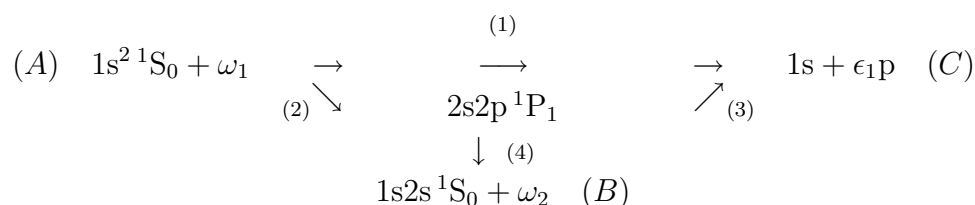
¹Institute of Applied Geophysics, Rostokinskaya 9, 129128 Moscow, Russia

²National Research Center ‘Kurchatov Institute’, Akademica Kurchatova pl., 123182 Moscow, Russia

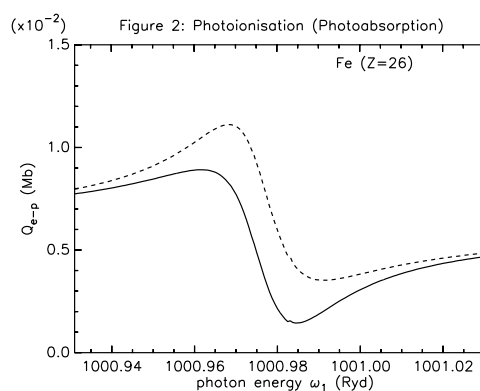
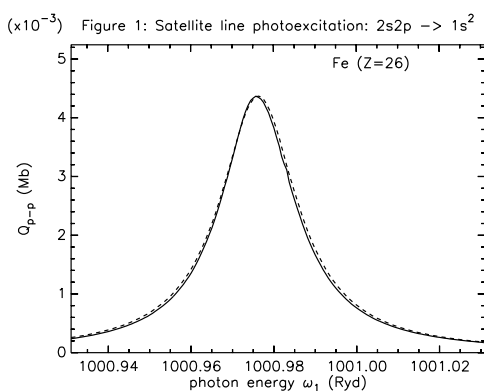
³IAS, UMR8624, Université Paris-Sud, 91405 Orsay, France.

E-mail: jacques.dubau@ias.u-psud.fr

Photoionization/photoabsorption cross sections were computed by the Breit-Pauli R-matrix code [1] for $1s^2$ and $1s2s \ ^1S_0$ near $2s2p \ ^1P_1$. The method takes into account processes (1), (2) and (3). To insert process (4), we use Davies and Seaton radiative damping theory [2], as done in [3].



ω and ϵ are photon and electron energies (a.u.). As example, we consider He-like iron. In figure 1, the cross-section for the transition $(A) \rightarrow (B)$ is plotted (continuous curve), i.e. $2s2p \ ^1P_1$ to $1s2s \ ^1S_0$ photo-excitation. This curve can be fitted to a Lorentzian profile (dashed line). In figure 2, the photoionization cross-section $(A) \rightarrow (C)$ is plotted (continuous line) as well as the photoabsorption cross-section (dashed line), which is the sum of the two preceding processes.



References:

- [1] Badnell N R <http://amdpp.phys.strath.ac.uk/tamoc/codes/serial/asy/>
- [2] Davies P C W and Seaton M J *J. Phys. B: At. Mol. Phys.* **2** 757 (1969).
- [3] Zabaydullin O and Dubau J *J. Phys. B: At. Mol. Opt. Phys.* **45** 115002 (2012).