

"High Accuracy Atomic Physics in Astronomy", IP/ITAMP workshop, August 7-9, 2006, The Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, in honor of Prof. Micheal J. Seaton

## PHOTOIONIZATION OF Fe V AROUND THE $3p \rightarrow 3d$ CORE EXCITATION REGION

Manuel A. Bautista

*Centro de Fisica, IVIC, 8424 NW 56 Street, Suite CCS00205, Miami, FL 33166, USA*

Email: bautista@KANT.IVIC.VE

The photoionization cross sections of Fe v are revised on the light of recent experimental measurements. It is found that in order to calculate accurate cross sections through the close-coupling method one must account for three important effects: (1) one-electron orbitals used to represent the target ion must be optimized not only based on the target itself, but also on the states of the ionizing system. This is important in order to get the right positions of  $3p \rightarrow 3d$  states with respect to the ionization threshold. (2) It is important to include the effects of coupling of  $3p^5 3d^N$  states to the continuum, thus the parent states  $3p^5 ed^{N-1}$  of the target have to be explicitly included in the close-coupling expansion. This is necessary for an accurate computation of resonances, but it leads to very large calculations. (3) In constructing synthetic models is important to remove high unresolved resonances out of theoretical cross sections. Such features can be responsible for noticeable spikes or troughs that do not conform to experimental cross sections. The new theoretical cross sections agree very well with the experimental data.