

Abstract Submitted  
for the DAMOP05 Meeting of  
The American Physical Society

**Electron-impact excitation of FeII**<sup>1</sup> OLEG ZATSARINNY, KLAUS BARTSCHAT, Drake University — We have applied the  $B$ -spline  $R$ -matrix method [1,2] to study electron-impact excitation of  $\text{Fe}^+$  over an energy range from threshold to 5 eV. A major challenge for this astrophysically important collision system is the very complex target structure, with a strong term-dependence in the individual orbitals. Using a multi-configuration Hartree-Fock method with non-orthogonal orbitals allows us to generate individually optimized term-dependent orbitals and thereby limit the number of configurations that need to be kept in both the  $N$ -electron target and the  $(N + 1)$ - electron collision problems. Overall, our results for individual cross sections and effective collision strengths are in qualitative agreement with the predictions by Ramsbottom *et al.* [3], but we find significant discrepancies in the very complex near-threshold resonance structure.

[1] O. Zatsarinny and C. Froese Fischer, *J. Phys. B* **33**, 313 (2000).

[2] O. Zatsarinny and K. Bartschat, *J. Phys. B* **37**, 2173 (2004).

[3] C.A. Ramsbottom, C.J. Noble, V.M. Burke, M.P. Scott and P.G. Burke, *J. Phys. B* **37**, 3609 (2004).

<sup>1</sup>Work supported by the NSF under PHY-0244470 and PHY-0311161.

Klaus Bartschat  
Drake University

Date submitted: 28 Jan 2005

Electronic form version 1.4