

Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

Atomic transitions among the levels of $3d^6$, $3d^54s$, $3d^54p$ configurations in Fe III¹ NARAYAN C. DEB, ALAN HIBBERT, Queen's University Belfast — We present a configuration interaction (CI) calculation for the fine-structure levels of Fe III belonging to $3d^6$, $3d^54s$ and $3d^54p$ configurations. All 136 LS states of these three configurations are considered. Using Hartree-Fock functions for 1s, 2s, 2p, 3s, 3p and 3d we have generated further radial functions for 4s, 4p, 4d, 4f, 5s, 5p, 5d, 5f and 6p orbitals. 4s and 4p orbitals are taken as spectroscopic and remaining orbitals taken as either correction or correlation orbitals. Relativistic effects are accounted for through Mass correction and Darwin terms in addition to an approximate form of the two-body spin-orbit interaction term. Ab initio fine-structure levels are then fine-tuned to bring them in line with the available NIST values. We then calculate the oscillator strengths and transition probabilities for all possible E1 transitions. CIV3 program of Hibbert [*Comp. Phys. Commn.* **9** 141 (1975)] has been used for the present calculation. The results will be presented at the conference.

¹This work is supported by the PPARC, UK through the Rolling Grant PP/D00103X/1.

Narayan C. Deb
Queen's University Belfast

Date submitted: 04 Jan 2007

Electronic form version 1.4