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Calculations of the Raman photoionization cross section for bound-free transitions in Neon-like Iron MICHAEL KRUSE, JAMES GAFFNEY, CARLOS IGLESIAS, BRIAN WILSON, Lawrence Livermore National Laboratory — The recent higher-than-expected solar opacity measurements of Bailey *et al* on the Sandia Z-machine have raised questions over the accuracy of theoretical opacity models near the solar convection-radiation boundary[1]. Of concern in particular are the Iron opacities for which discrepancies of 30%-400% were found between theory and experiment. Naturally the question has been raised whether theoretical models have neglected to include all the relevant atomic physics processes. In this talk we discuss the effects of the hitherto neglected two-photon ionization cross section for bound-free transitions in Neon-like Iron (a prominent charge state in the solar convection-radiation region). The calculations proceed by solving the Schroedinger equation for an electron moving in a parameterized mean-field potential that has been fitted to experimental data. The required dipole transition strength is calculated by the Dalgarno and Lewis method which exactly recovers the summation over the infinite set of intermediate states between the initial and final state. Conclusions are given with respect to opacity models.

[1]J.E. Bailey *et al*, Nature **517**, 56-59

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