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**Spectroscopy of Atomic Systems under Plasma Environment**

AMAR NATH SIL, Indian Association for the Cultivation of Science, Jadavpur, Kolkata 700 032, India, S. FRITZSCHE, Institut für Physik, Universität Kassel, 34109 Kassel, Germany, P. K. MUKHERJEE, Indian Association for the Cultivation of Science, Jadavpur, Kolkata 700 032, India — Extensive model calculations have been performed to study the effect of plasma on the structural properties like ground and excited energy levels, dipole polarizabilities, oscillator strengths, transition probabilities of hydrogen and helium like systems. For weak coupling case Debye screening model and for strong coupling case Ion Sphere model of the plasma have been applied. We studied in particular the hydrogen like carbon, aluminium and argon and helium like carbon under different plasma coupling strengths. Time dependent linear response theory has been utilized in finding the excitation properties of the ionic systems under such plasma conditions. The spectral line shifts have been calculated and ionization pressure has been estimated using finite boundary conditions imposed on the wave functions. It is noted that with finite plasma coupling the ionization potential decreases and the number of excited states become finite. The system approaches towards instability gradually as the strength of the coupling is increased. Theoretical estimates of the spectral line positions under such plasma for several hydrogen like systems seem to be in very good agreement with the experimental observations with laser produced plasmas.

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