HULLAC-v9 and SCO-RCG atomic spectral LTE opacity data

(lines, Rosseland and Planck means)

for astrophysical and laser applications: results and discussion

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HULLAC-v9 is an atomic and opacity code dedicated to calculate precise atomic data and detailed emission and absorption spectra for many applications [1-3]. In particular it allows user to select different schemes of Configuration Interaction (CI): CI among Non-Relativistic Configuration ("CI in NRC"), among selected groups of configurations, or among all (full CI) configurations. The important challenge of treating full CI is of great importance for astrophysical (Fe, Ni) and laser applications, but cannot be applied to the whole spectra, as it is really very much time and memory consuming. Thus full CI treatment is not included in usual opacity codes.

The atomic SCO-RCG opacity code [4] can provide precise spectral opacities over the whole spectral range and thus Rosseland and Planck means, assuming Configuration Interaction as "CI in one non Relatistic Configuration". Both atomic code calculations have been compared to experimental data.

We have already discussed influence of CI on M shell Fe, Ni, Cu… opacities [5-7]. We shall present here last results and strategies to combine the possibilities of the two codes to provide precise detailed spectra and means in case of relevant astrophysical and laser experimental conditions.

References

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