Benchmarking algorithms for the solution of Collisional Radiative Model (CRM) equations.[1] MARCEL KLAPISCH, ARTEP, Inc., Ellicott City, MD 21042, MICHEL BUSQUET, Observatoire de Paris, France — Elements used in ICF target designs can have many charge states in the same plasma conditions, each charge state having numerous energy levels. When LTE conditions are not met, one has to solve CRM equations for the populations of energy levels, which are necessary for opacities/emissivities, Z* etc. In case of sparse spectra, or when configuration interaction is important (open d or f shells), statistical methods[1] are insufficient. For these cases one must resort to a detailed level CRM rate generator[2]. The equations to be solved may involve tens of thousands of levels. The system is by nature ill conditioned. We show that some classical methods do not converge. Improvements of the latter will be compared with new algorithms[3] with respect to performance, robustness, and accuracy.

[1] A Bar-Shalom, J Oreg, and M Klapisch, J. Q. S. R. T.,65, 43 (2000).
[2] M Klapisch, M Busquet and A. Bar-Shalom, Proceedings of APIP'07, AIP series (to be published).
[3] M Klapisch and M Busquet, High Ener. Density Phys. 3,143 (2007)

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