

THE OPACITY PROJECT — A POST-SCRIPT

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RESUMEN. Se presentan los nuevos resultados del Proyecto de la Opacidad obtenidos en Enero de 1992.

ABSTRACT. New Opacity Project results of January 1992 are presented.

Key words: OPACITIES

The Editors have kindly given us permission to add a post-script just before this volume goes to press (January, 1992). The atomic data used by the Opacity Project (OP) are discussed in this volume in the paper by Seaton *et al.*, and results for opacities in that by Yu Yan. In addition to the basic R-matrix data we included PLUS data for some ions of Fe. The results reported at the meeting were obtained with inclusion of a large number of PLUS transitions of the type n to n' with $n > 3$ and $n' > n$. Subsequent work by Yu Yan led to the detection of a coding error by Seaton in the calculation of the populations of the PLUS states. In consequence of that error the results given in Figure 2 of the paper by Yu Yan are not correct.

Subsequent to the Workshop we have made new calculations with inclusion of a large number of different PLUS lines, mainly due to transitions of the type $n = 3$ to $n' = 4$ in Fe IX to XIII. The required atomic data are obtained using the code SUPERSTRUCTURE, and most of the new atomic calculations have been made by Peter Storey and Tony Lynas-Gray. We are making extensive checks on the convergence of the opacity results with respect to the atomic data included. Although these checks are not yet fully complete we feel reasonably confident that addition of further data will not lead to any major changes in our opacity results.

Figure 1, A and B, shows our latest OP results, and compares them with those of OPAL (Iglesias and Rogers, this volume). A shows results for a mixture of H and He, $X=0.7$, $Z=0.0$. The agreement is generally close but there are smallish differences at high temperatures and densities, a region where calculated opacities can be sensitive to details of the EOS. B shows results for a solar mix, $X=0.7$, $Z=0.02$, AG abundances. The level of agreement between OP and OPAL is such as to leave no doubt about the increase in opacities, compared with earlier work. There are some differences which will require further discussion. These are, again, most serious in the region of high temperatures and densities.

We are much indebted to Carlos Iglesias and Forrest Rogers for many helpful discussions.

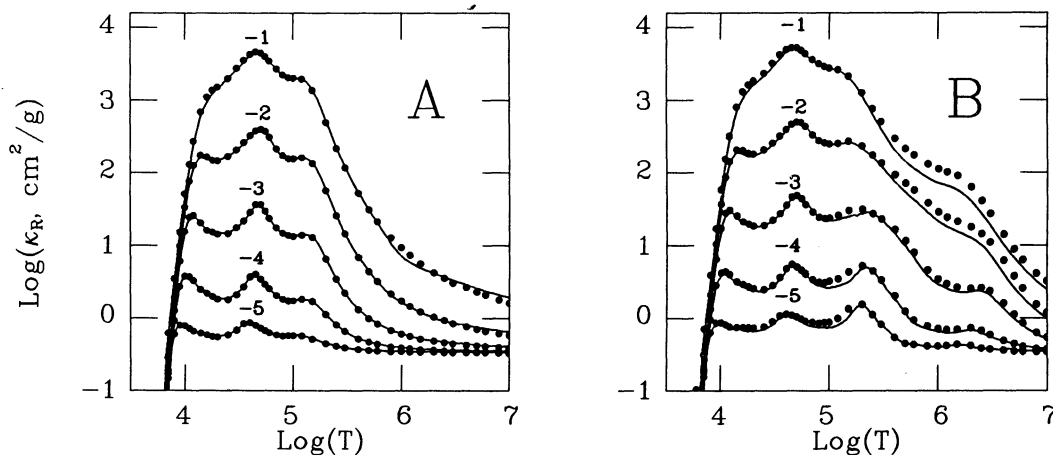


Figure 1. Opacities: OP full line, OPAL filled circles. A: $X=0.7$, $Z=0.0$. B: $X=0.7$, $Z=0.02$. Curves are labelled with values of $\log(R)$.