

# Electron impact excitation of Astrophysically Important C III Ion

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Recently, Fernández-Menchero *et al.* (2014) reported effective collision strengths  $\Upsilon$  for transitions among 238 *fine-structure* levels, belonging to the  $n \leq 7$  configurations of C III. They adopted the (semi-relativistic) *R*-matrix code (ICFT), resolved resonances in a fine energy mesh, averaged  $\Omega$  over a Maxwellian distribution, and reported results over a wide range of electron temperature up to  $1.8 \times 10^7$  K. We have also performed similar calculations among 166 levels of the  $n \leq 5$  configurations by adopting the GRASP and DARC codes, and determined  $\Upsilon$  up to  $T_e = 800\,000$  K. However, we observe large discrepancies, of more than an order of magnitude for about 20 % transitions (among the lowest 78 levels) and over the complete temperature range of the results. In most cases their results are larger, up to a factor of 20. Figure 1 shows the ratios  $R = \Upsilon_{DARC} / \Upsilon_{ICFT}$  for all transitions among the lowest 78 levels at a temperature of 90 000 K. Negative values correspond to  $\Upsilon_{ICFT} / \Upsilon_{DARC}$ . Differences for a few transitions, particularly those with upper levels  $> 60$ , are pronounced. Similarly, we see the discrepancies of up to a factor of two for about half the transitions (not shown) at the lowest temperature of 1800 K, and in the majority of cases  $\Upsilon_{ICFT} > \Upsilon_{DARC}$ . Detailed results and comparisons can be found in Aggarwal & Keenan (2015).

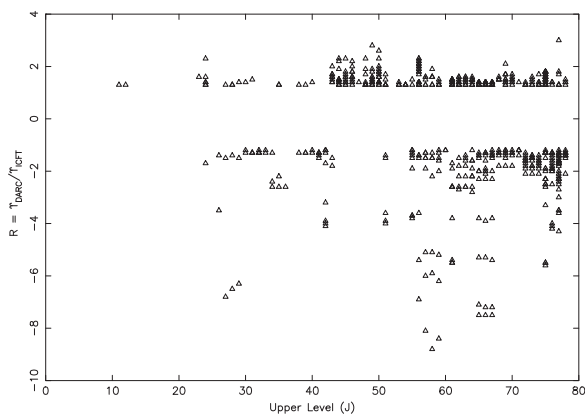


Figure 1. Ratios  $\Upsilon_{DARC} / \Upsilon_{ICFT}$  for transitions of C III.

## Reference

- Fernández-Menchero, L., Del Zanna, G., & Badnell, N. R. 2014, *A&A*, 566, A10  
Aggarwal, K. M. & Keenan, F. P. 2015, *MNRAS*, 450, 1151