Poster

QUANTUM AND SEMICLASSICAL STARK BROADENING OF $3s$-np AND nd-$5f$ TRANSITIONS IN C IV, N V, Mg X AND Al XI

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Diagnostic of stellar and laboratory plasmas, atomic abundances, opacity calculations, particles densities can be determined through knowledge of Stark broadening of isolated spectral lines of multicharged ions in plasmas.

In this work, we apply our quantum-mechanical expression (Elabidi *et al.* 2004) to the calculations of electron impact Stark widths of the $3s - np$ and $nd - 5f$ ($n = 3, 4$) transitions in C IV, N V, Mg X and Al XI. This method has been used several times for the $2s3s - 2s3p$ transitions in Be-like ions and for the $3s - 3p$ transitions in Li-like ions. This method gives a good agreement with experimental results especially for highly charged ions (Elabidi *et al.* 2007, 2008). Calculations are made in the frame of the impact approximation and for intermediate coupling, taking into account fine structure effects.

A comparison between our calculations (quantum and semiclassical) and experimental results shows an improved agreement for the $3s - np$ transitions. But we report here a significant disagreement for the nd-5f transitions. This discrepancy was also reported for these transitions in C IV and N V ions (Dimitrijević and Sahal-Bréchot 1991, 1992).