

The effect of electron correlation on trielectronic recombination rate coefficients for Be-like ions

The merged-beam rate coefficients of dielectronic and trielectronic recombinations (DR and TR) for Be-like ions have been measured in many experiments. Meanwhile, theoretical data were also calculated with AUTOSTRUCTURE (AS) code for comparison with the measured resonance spectrum. However, TR resonance strengths were generally significantly underestimated by the AS calculations in most cases. In the present work, we find that the electron correlation between DR and TR resonance states with different captured electron principal quantum numbers n can lead to an obvious improvement in TR resonance strengths, which is cross-validated via the relativistic distorted-wave (RDW) approximation implemented in the Flexible Atomic Code (FAC) and the semi-relativistic distorted-wave (SRDW) approximation implemented in the AS code. Previous theoretical calculations for this system, however, did not include this form of electron correlation.

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