

Abstract Submitted
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B-spline R-matrix calculations for electron-impact excitation of N^{3+} .¹ LUIS FERNANDEZ-MENCHERO, OLEG ZATSARINNY, KLAUS BARTSCHAT, Drake University — There are major discrepancies between recent ICFT (Intermediate Coupling Frame Transformation) [1] and DARC (Dirac Atomic R-matrix Code) calculations [2] regarding electron-impact excitation rates for transitions in several Be-like ions. To identify possible reasons for these discrepancies and to estimate the accuracy of the various results, we carried out independent B-Spline R-Matrix (BSR) calculations for electron-impact excitation of N^{3+} . Our close-coupling expansions contain the same 238 target states as the previous ICFT and DARC calculations, but with an improved representation of the target structure. We find close agreement among all calculations for the strong transitions between low-lying states, whereas serious discrepancies remain for the weak transitions and those involving high-lying excited states. The variations in the final results for the collision strengths are mainly due to differences in the structure description, specifically the inclusion of correlation effects, rather than the treatment of relativistic effects or problems with the validity of the three methods to describe the collision. [1] L. Fernández-Menchero *et al.*, *Astron. Astroph.* **566** (2014) A104. [2] K. M. Aggarwal *et al.*, *Mon. Not. R. Astr. Soc.* **461** 3997.

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