Abstract Submitted
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B-spline calculations of oscillator strengths in noble gases.[1] OLEG ZATSARINNY, KLAUS BARTSCHAT, Drake University — The B-spline box-based close-coupling method [1] was applied for extensive calculations of the transition probabilities in the noble gases Ne, Ar, Kr and Xe for energy levels up to $n = 12$. An individually optimized, term-dependent set of non-orthogonal one-electron radial functions was used to account for the strong term dependence in the valence orbitals. The core-valence correlation was introduced through multi-channel expansions, which include the ns^2np^5, $nsnp^6$ and $ns^2np^4(n+1)l$ target states. The inner-core correlation was accounted for by employing multi-configuration target states. Energy levels and oscillator strengths for transitions from the np^6 ground-state configuration as well as transitions between excited states were computed in the Breit-Pauli approximation. The inner-core correlation was found to be very important for most of the transitions considered. The good agreement with the available experimental data shows that the B-spline method can be used for accurate calculations of oscillator strengths for states with intermediate n-values, i.e. exactly the region where it is difficult to apply standard MCHF methods. At the same time the accuracy for the low-lying states is close to the accuracy obtained in large-scale MCHF calculations [2]. [1] O. Zatsarinny and C. Froese Fischer, J. Phys. B **35,** 4669 (2002). [2] A. Irimia and C. Froese Fischer, J. Phys. B **37,** 1659 (2004).

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