Theoretical energy levels, transition rates, lifetimes, hyperfine structures and isotopic shifts for the $SnXLIX$ spectrum of Plasma interest

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We disclose relativistic multiconfiguration Dirac-Hartree-Fock (MCDHF) spectrum calculations for Sn XLIX. Energy levels, weighted oscillator strengths, isotope shifts, hyperfine structure and Landé g_J factors are calculated for 127 odd- and even-parity states as well as lifetimes and transition rates between these states[1]. To scrutinize the accuracy of our results, we have implemented parallel calculations using a Flexible Atomic Code (FAC)[2] by introducing the Second-Order Many-Body Perturbation Theory (MBPT) method. Additionally, the Breit interaction and leading quantum electrodynamic effects (QED) are included as perturbations in extensive relativistic configuration interaction (RCI) calculations. The results arising in the two sets of calculations $MCDHF$ and $MBPT$ are quite close. We signal that, our calculations for $SnXLIX$ are made for the first time and they provide to date the most accurate and complete atomic data. The results can be used in the line identification, plasma modeling and diagnostics of astrophysical plasmas.

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[2] D. E. Salhi, P. Quinet, H. Jelassi, Atom. Data. Nucl. Data. **Accepted**, DOI: https://doi.org/10.1016/j.adt.2018.04.003. (2018).