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Term classifications and Breit-Pauli oscillator strengths of neutral tin PAUL OLIVER, ALAN HIBBERT, Department of Applied Mathematics and Theoretical Physics, The Queen's University of Belfast, Belfast BT7 1NN, N. Ireland, UK — Spectroscopic observation of embedded tin impurity is being investigated as a potential diagnostic for monitoring the erosion of vessel wall tiles in fusion power plants [1], requiring accurate estimates of the oscillator strengths (OS) of the neutral and near-neutral lines. In response to this, we have undertaken (to our knowledge) the first extensive Breit-Pauli configuration interaction (CI) calculation of transitions among the lower-lying levels in Sn I, using the atomic structure code CIV3 [2]. One-electron functions have been carefully optimised to represent accurately the main configurations, accounting for the LS -dependency of the orbitals, and all important correlation and polarisation effects. We present our assigned energy level term classifications, highlighting the significant inconsistencies in the literature. Present results agree favourably with other sparsely available experimental and theoretical work (mostly focusing on transitions involving the $5p^2$ ground configuration). We observe excellent agreement in the length and velocity forms of the OS.

- [1] Foster A R, Counsell G F and Summers H P 2007 *J. Nucl. Mater.* **363-365** 152
- [2] Hibbert A 1975 *Comput. Phys. Commun.* **9** 141

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