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Valence calculations of lanthanide anion binding energies: a comprehensive study[1] STEVEN M. O'MALLEY, DONALD R. BECK, Physics Department, Michigan Technological University — We have applied a methodology of universal jls restrictions on the $4f^n$ subgroup of relativistic configuration-interaction calculations of progressively more complex lanthanide anions[2,3,4]. Our completed study of the row predicts bound $6p$ attachments to all lanthanide ground state configurations except Yb, additional $6p$ attachments to excited opposite parity configurations in Tb and Lu, and $6s$ attachments to excited open-$6s$ thresholds in La, Ce, Pr, and Gd. In total we predict more than 100 bound states for the lanthanide anions, and we hope this comprehensive study encourages further experimental[5,6] interest in these anions. Such measurements will be useful in "fine tuning" these *ab initio* binding energies to account for missing core-valence correlation and the approximations that were necessary in these complex calculations.

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