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Large-scale Relativistic Configuration-interaction Calculations for the 2s-2p and 3s-3p Transition Energies of Xenon Ions

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Large-scale relativistic configuration-interaction calculations for the 2s-2p and 3s-3p transition energies of xenon ions

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Poster Presentation

The 2s-2p_{1/2} transition energies for Li-, Be- and B-like xenon and 3s-3p_{3/2} transition energies for Na- and Mg-like xenon are calculated using the relativistic configuration-interaction (RCI) method. These calculations are based on the *no-pair* Hamiltonian that includes both Coulomb and Breit interactions and use one-electron B-spline orbitals as basis functions. Large-scale RCI expansions include single and double excitations from the valence and core electrons and reach 350,000 configurations for accurate evaluations of relativistic correlation energies. Along with quantum electrodynamic (QED) and mass polarization (MP) corrections calculated here, our transition energy results are in very good agreement with those from high precision EBIT measurements. Work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under contract No. DE-AC52-07NA27344.