Abstract Submitted
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Transitions between the $4f$-core-excited states in Ir^{16+}, Ir^{17+}, and Ir^{18+} ions for clock applications U. I. SAFRONOVA, University of Nevada, Reno, V. V. FLAMBAUM, University of New South Wales, M. S. SAFRONOVA, University of Delaware, Newark — Iridium ions near $4f$-$5s$ level crossings are the leading candidates for a new type of atomic clocks with a high projected accuracy and a very high sensitivity to the temporal variation of the fine structure constant α. To identify spectra of these ions in experiment accurate calculations of the spectra and electromagnetic transition probabilities should be performed. Properties of the $4f$-core-excited states in Ir^{16+}, Ir^{17+}, and Ir^{18+} ions are evaluated using relativistic many-body perturbation theory and Hartree-Fock-Relativistic method (COWAN code). We evaluate excitation energies, wavelengths, oscillator strengths, and transition rates. Our large-scale calculations included the following set of configurations: $4f^{14}5s$, $4f^{14}5p$, $4f^{13}5s^2$, $4f^{13}5p^2$, $4f^{13}5s5p$, $4f^{12}5s^25p$, and $4f^{12}5s5p^2$ in Pm-like Ir^{16+} ; $4f^{14}$, $4f^{13}5s$, $4f^{13}5p$, $4f^{12}5s^2$, $4f^{12}5s5p$, and $4f^{12}5p^2$ in Nd-like Ir^{17+}; and $4f^{13}$, $4f^{12}5s$, $4f^{12}5p$, $4f^{11}5s^2$, and $4f^{11}5s5p$ in Pr-like Ir^{18+}. The $5s-5p$ transitions are illustrated by the synthetic spectra in the 180 - 200 Å range. Large contributions of magnetic-dipole transitions to lifetimes of low-lying states in the region 2.5 Ry

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