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Modeling lattice light shifts in optical lattice clocks KYLE BELOY, National Institute of Standards and Technology Boulder, WILLIAM MCGREW, National Institute of Standards and Technology Boulder Department of Physics, University of Colorado, Boulder, XIAOGANG ZHANG, DANIELE NICOLODI, National Institute of Standards and Technology Boulder, ROBERT FASANO, YOUSSEF HASSAN, National Institute of Standards and Technology Boulder Department of Physics, University of Colorado, Boulder, ROGER BROWN, National Institute of Standards and Technology Boulder, ANDREW LUDLOW, National Institute of Standards and Technology Boulder Department of Physics, University of Colorado, Boulder — Optical lattice clocks rely on a strong perturbation to the atoms for atomic confinement. Within the optical lattice, the atomic levels are light-shifted by an amount 10^{-10} times the clock frequency. While clock performance has steadily improved over the years, with fractional inaccuracies at the low-10^{-18} level now being realized, lattice light shifts have invariably been a dominant item in the uncertainty budgets. To realize new levels of clock performance, better theoretical models will be required for characterizing the lattice light shifts. Here we present a new model developed for this purpose.

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