Optimization of a laser pulse for xuv Raman excitation of neon using quantum control combined with multichannel electronic structure

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— We present a combined quantum control and electronic structure technique for optimizing laser pulses. Krotov’s method of control which monotonically improves a given cost function is combined with the multichannel time-dependent configuration interaction singles (TDCIS) method [Greenman, et. al. PRA 82, 023406 (2010)]. We apply this technique to optimize an xuv laser pulse to perform the Raman excitation of Ne to the $1s^22s^22p^53p$ state through the intermediate resonance $1s^22s^12p^63p$ state. Quantum control is useful to minimize ionization and population of other states in this process.

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