Abstract Submitted
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Non-Linear Interactions in Pump-Probe Optical Phenomena for Moving Atomic Systems[1] VERNE JACOBS, Naval Research Labortory — Reduced-density-matrix descriptions are developed for pump-probe optical phenomena involving moving many-electron atomic systems, taking into account the center-of-mass motion, collisions, and external magnetic fields. Time-domain (equation-of-motion) and frequency-domain (resolvent-operator) formulations are developed in a unified manner. A semiclassical perturbative treatment of the electromagnetic interaction is used to obtain compact Liouville-space operator expressions for the n'th order non-linear macroscopic electromagnetic-response tensors. Coherent atomic excitations and the full tetradic-matrix form of the collision operator in the Markov approximation are taken into account.

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Verne Jacobs
Naval Research Labortory

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