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The application of quasi-steady approximation in atomic kinetics in simulation of hohlraum radiation drive GUOLI REN, WENBING PEI, KE LAN, PEIJUN GU, XIN LI, INSTITUTE OF APPLIED PHYSICS AND COMPUTIONAL MATHEMATICS TEAM — In current routine 2D simulation of hohlraum physics, we adopt the principal-quantum- number(n-level) average atom model(AAM). However, the experimental frequency-dependant radiative drive differs from our n-level simulated drive, which reminds us the need of a more detailed atomic kinetics description. The orbital-quantum-number(nl-level) AAM is a natural consideration but the in-line calculation consumes much more resources. We use a new method to built up a nl-level bound electron distribution using in-line n-level calculated plasma condition (such as temperature, density, average ionization degree). We name this method "quasi-steady approximation." Using the re-built nl-level bound electron distribution (P_{nl}), we acquire a new hohlraum radiative drive by post-processing. Comparison with the n-level post-processed hohlraum drive shows that we get an almost identical radiation flux but with more-detailed frequency-dependant structures.

Guoli Ren

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