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Simulation for radiative transfer of ultra-intense x-ray pulses through a solid-density aluminum plasma CHENG GAO, JIAOLONG ZENG, JIANMIN YUAN, National University of Defense Technology — Radiative transfer of ultra-intense x-ray pulses through a 1 um thick solid-density aluminium sample is investigated theoretically by solving a one-dimensional radiative transfer equation. The populations of quantum states are obtained by solving a time-dependent rate equation based on collisional-radiative approximation, which are used to determine the absorption and emission coefficients of the aluminium sample.T ransmission of the ultra-intense x-ray pulses as a function of photon energy is calculated and compared with a recent experiment, where good agreement is found and saturable absorption is evidently observed.

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