High gain predictions for Ni-like Gd ion

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Abstract

Atomic structure data and effective collision strengths for $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6 3d^{10}$ and 54 fine-structure levels contained in the configurations $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6 3d^9 4l$ (l = s, p, d, f) for the nickel-like Gd ion. These data are used in the determination of the reduced population for the 55 fine structure levels over a wide range of electron densities (from 10^{21} to 10^{23}) and at various electron plasma temperatures. The gain coefficient for those transitions with positive population inversion factor are determined and plotted against the electron density.

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