High gain predictions for Ni-like Gd ion

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Abstract

Atomic structure data and effective collision strengths for 1s² 2s² 2p⁶ 3s³ 3p⁶ 3d⁴(l = s, p, d, f) and 54 fine-structure levels contained in the configurations 1s² 2s² 2p⁶ 3s³ 3p⁶ 3d⁴4l 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 10²¹ to 10²³) 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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