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Low temperature photoluminescence in the strongly disordered dilute nitride GaAsN. IVANA BOSA, DERMOT MCPEAKE, Tyndall National Institute, University College Cork, Ireland, STEPHEN FAHY, Tyndall National Institute and Department of Physics, University College Cork, Ireland — Photoluminescence (PL) due to the radiative recombination of excitons is used to study the structural disorder of alloys. We calculate the PL spectra at finite temperatures in the dilute nitride GaAsN. The shape of PL spectra is determined by the exciton occupation under steady-state optical excitation. Exciton energy levels and wave functions are calculated numerically in a supercell geometry with a strong random alloy potential acting on the electron. The distribution of electrons in states of the random potential is found by solving a kinetic equation, including phonon-assisted transitions between states and radiative recombination. Results are compared to the recent experiments.

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