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Monte Carlo simulation of 337.1 nm and 391.4 nm emission due to the electron thermalization in Nitrogen.[1] ZORAN PETROVIC, VLADIMIR STOJANOVIC, Institute of Physics, Belgrade — Electron thermalization in nitrogen is studied by Monte Carlo simulations for electron energies from 20 eV to 10 keV. The purpose of this work is to clarify the origin of electron excitation of Second Positive System (2P) corresponding to $C^3\Pi_u$-$B^3\Pi_g$ transition at energies much higher than ionization the threshold. Such emission occurs when cosmic ray induced particles are thermalized in the atmosphere and may be used to detect very high energy elementary particles. Spatially resolved emission profiles are calculated at pressures of 1 Torr and 760 Torr. Relaxation of the electron energy is followed. At the same time anisotropic scattering for elastic and inelastic collisions, and energy partitioning in ionization events are included in the model. We proved that secondary electrons significantly affect the emission of 2^+ emission band while their effect on 1^- emission band is minimal. For 337.1 nm emission, we find that below 30 eV, single collisions of secondary electrons with gas are main the source of excitation while number of multiple electron collisions with gas significantly increase with energy. For electron energies up to 10 keV, single collisions of secondary electrons dominate in excitation of 391.4 nm emission.

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