

Abstract Submitted
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Monte Carlo simulation of the profiles of H α emission in hydrogen Townsend discharges at high E/N¹ ZORAN PETROVIC, VLADIMIR STOJANOVIC, Institute of Physics, Belgrade — Our goal is to calculate H α emission from Townsend discharge in pure hydrogen between two parallel electrodes. Monte Carlo simulation technique was used to follow electrons and heavy particles for the conditions of high electric field (E) to gas density (N) ratios E/N ... We used simple cross section sets for heavy particles, as provided by A.V. Phelps, where fast H atoms were produced by charge transfer collisions of H⁺, H₂⁺, H₃⁺ with H₂ and with the surface. After collisions we followed trajectories of all reaction fragments until their neutralization or thermalization down to the H α excitation energy... As a result, for the conditions of experiment, we obtained spatially resolved emission profiles and end on Doppler broadened profiles. Agreement of Monte Carlo with experimental results supported prediction that the main excitation channel of H α emission proceeds via fast H atoms.

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