

Abstract Submitted  
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**$H_\alpha$  emission in pure hydrogen Townsend discharge obtained by a Monte Carlo simulation** VLADIMIR STOJANOVIC, ZELJKA NIKITOVIC, ZORAN PETROVIC, Institute of Physics — We calculated  $H_\alpha$  emission profiles from Townsend discharges in pure hydrogen between two parallel electrodes focusing on details of heavy particle interaction with the cathode surface. The basic data were provided by A. Phelps [1]. Monte Carlo simulation technique employing null collision method was used to follow electrons and heavy particles between collisions with  $H_2$  or with surface for the conditions of a high electric field ( $E$ ) to gas density ( $N$ ) ratios  $E/N$ . Trajectories of reaction fragments are followed after the collision until their neutralization or thermalization down to the threshold of  $H_\alpha$  excitation. For the conditions of Phelps and Petrović's experiment [2], we obtained spatially resolved emission profiles and Doppler broadened line profiles. Intensity of Doppler profile wing showing  $H_\alpha$  emission of particles emerging from the cathode direction is obtained assuming that the reflection coefficient of fast H atoms depends on the incident angle and on energy of the incident particle. Some effects of collision dynamic of heavy particles with  $H_2$  on Doppler broadened profile are discussed.

[1] A.V. Phelps to be published.

[2] Z.Lj. Petrović and A.V. Phelps to be published.

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