Abstract Submitted
for the GEC20 Meeting of
The American Physical Society

Optical characteristics of a gas discharge in mixtures of sulfur vapor with inert gases[1] SVETLANA AVTAEVA[2], Institute of Laser Physics SB RAS, ANDRIY HENERAL[3], Institute of Electronic Physics NAS of Ukraine — The discharge in mixtures of inert gas with sulfur vapors is an effective source of radiation spectrum, which is similar to solar in the wavelength range of 280-600 nm due to strong emission of S2 molecules. This paper presents optical properties of the pulsed-periodic discharge (the pulse $\leq$10 kV with duration of several μs and repetition frequency of 10 kHz) in mixtures of argon with sulfur vapour in the wavelength range of 300-700 nm. In this wavelength range strong bands of S2 molecules are observed in the discharge radiation along with Ar and S lines. Radiation of S2 bands dominates at argon pressure less than 30 Torr. The radiation efficiency of sulfur dimer bands rises with increase in temperature of gas-discharge tube walls. Kinetics of excited sulfur molecules in the discharge is studied using a global model. Time profiles of plasma species densities under various Ar-S2 mixture compositions during voltage pulses were calculated. It is shown, that densities of S2 excited molecules fast increases at the voltage pulse beginning and reach maximum after about 2 μs, strong radiation of S2 excited molecules is characteristic for this time.

[1]The authors are very grateful to Prof. V. A. Kelman for useful advices and scientific discussions
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Date submitted: 11 Jun 2020 Electronic form version 1.4