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Low-pressure inductive gas discharges in Ar, Kr, He and Ar+Hg mixture NATALIA DENISOVA, Institute of Theoretical & Applied Mechanics, REVALDE GITA, SKUDRA ATIS, Institute of Atomic Physics and Spectroscopy, University of Latvia — This paper presents results of theoretical and experimental investigations of high-frequency (HF) inductive gas discharges in Ar, Kr, He and Ar+Hg mixture in the pressure area of 0.1-10 Torr. The HF inductive discharges are known as effective sources of spectral lines. Our estimations predict that due to the skin-effect, high-frequency inductive discharge should have more high line intensity if compare with a DC discharge in the related conditions. The intensities of the Ar, Kr, He and Hg spectral lines in visible region are measured at a wide range of gas pressures varying the HF generator current. Tomographic reconstructions of spatial profiles of emitting mercury atoms in Ar+Hg discharge are performed. A stationary self-consistent model of high-frequency inductive discharge is developed including detailed kinetics of the excited atomic states. Based on the developed model, the spatial profiles of atoms in excited levels and emission properties of the discharge plasma are calculated. The detailed comparative analysis of the experimental and theoretical curves has been performed. We make the conclusion that numerical results are in good agreement with the experimental data. The obtained results - dependencies of the line intensities versus gas pressure and HF generator current - are discussed.

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