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Probe measurements of electron distribution function in a large-volume glow discharge device with coaxial gridded hollow electrodes. JINMING LI, CHENGXUN YUAN, ZHONGXIANG ZHOU, XIAOOU WANG, A. A. KUDRYAVTSEV, Harbin Institute of Technology, IYA P. KURLYANDSKAYA, V. I. DEMIDOV, West Virginia University — In this study the electron distribution function (EDF) in a weakly ionized plasma of a large-volume glow discharge device with coaxial gridded hollow electrodes has been measured with a single electric probe. The diameter and the length of the discharge chamber are 50 cm and 40 cm, respectively. The discharge is created by an ac power supply with a frequency of 20 kHz and a maximum power of 2,000 W, which can be varied from 500 W and up. Because of the bipolar diffusion, charged particles are generated between the two poles and spread rapidly to the central region of the discharge chamber, thus forming a homogeneous plasma. The discharge device has been described in details in [1]. The discharge has been created in helium gas at pressure from 40 to 60 Pa. The EDF for different discharge power in the range from 1,200 to 1,600 W and different pressures have been studied. The experimental results have been compared with modeled EDFs. [1] Yuan C., Kudryavtsev A. A., Saifutdinov A. I. et al., IEEE Transactions on Plasma Science, 45, 3110-3113, 2017.

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