Abstract Submitted
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Precise measurements of neutral gas temperature using Fiber Bragg Grating sensor in Argon capacitively coupled plasmas[1] DAOMAN HAN, ZIGENG LIU, YONGXIN LIU, WEI PENG, YOUNIAN WANG, School of Physics and Optoelectronic Technology, Dalian University of Technology, — Neutral gas temperature was measured using Fiber Bragg Grating sensor (FBGs) in capacitively coupled argon plasmas. Thermometry is based on the thermal equilibrium between the sensor and neutral gases, which is found to become faster with increasing pressure. It is also observed that the neutral gas temperature is higher than the room temperature by 10˜120 °depending on the experiental conditions, and gas temperature shows significant non-uniformity in space. In addition, radial profiles of neutral temperature at different pressures, resemble these of ion density, obtained by a floating double probe. Specifically, at low pressure, neutral gas temperature and ion density peak at the center of the reactor, while the peak appears at the edge of the electrode at higher pressure. The neutral gas heating is mainly caused by the elastic collisions of Ar+ with neutral gas atoms in the sheath region after Ar+ gaining a certain energy.

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