

Abstract Submitted  
for the GEC15 Meeting of  
The American Physical Society

**Fluid simulation and experimental measurement of radical densities in capacitively coupled CF<sub>4</sub>/Ar plasma**<sup>1</sup> YING-SHUANG LIANG, YONG-XIN LIU, YU-RU ZHANG, WEN-YAO LIU, YOU-NIAN WANG, Dalian University of Technology — Both of the two-dimensional self-consistent fluid model and the experimental diagnostic method are employed to investigate the effects of the external parameters on the plasma parameters, especially on the production and loss of the CF<sub>2</sub> and F radicals, in the capacitively coupled CF<sub>4</sub>/Ar plasmas driven at 60 MHz. It is observed that the CF<sub>3</sub> and F are the two main radicals under all the investigated conditions. With the increase of the discharge power, the densities of the CF<sub>2</sub> and F radicals increase almost linearly. By comparing the calculated and experimental results, it is found that the main production mechanism of the CF<sub>2</sub> radical is the electron-impact dissociation of CF<sub>4</sub>. However, the electron-impact dissociation of CF<sub>3</sub> plays an important role in the production of the F radicals, besides the electron-impact dissociation of CF<sub>4</sub>. The general qualitative agreement between the calculated and the experimental results indicates that the present fluid model correctly describes the CF<sub>4</sub>/Ar capacitive discharge.

<sup>1</sup>This work was supported by the National Natural Science Foundation of China (NSFC) (Grant Nos. 11335004, 11405018, 11405019) and the Important National Science and Technology Specific Project (Grant No. 2011ZX02403-001).

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Date submitted: 18 Jun 2015

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