Abstract Submitted
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A hybrid model of biased inductively coupled discharges[1] DEQI WEN, Dalian University of Technology, MICHAEL A LIEBERMAN, Uniersity of California, Berkeley, QUANZHI ZHANG, University of Anterwerp, YONGXIN LIU, YOUNIAN WANG, Dalian University of Technology — A hybrid model, i.e. a global model coupled bidirectionally with a parallel Monte-Carlo collision (MCC) sheath model, is developed to investigate an inductively coupled discharge with a bias source. To validate this model, both bulk plasma density and ion energy distribution functions (IEDFs) are compared with experimental measurements in an argon discharge, and a good agreement is obtained. On this basis, the model is extended to weakly electronegative Ar/O_2 plasma. The ion energy and angular distribution functions versus bias voltage amplitude are examined. The different ion species (Ar^+, O_2^+, O^+) have various behaviors because of the different masses. A low bias voltage, Ar^+ has a single energy peak distribution and O^+ has a bimodal distribution. At high bias voltage, the energy peak separation of O^+ is wider than Ar^+. [1]This work has been supported by the National Nature Science Foundation of China (Grant No. 11335004) and Specific project (Grant No 2011X02403-001) and partially supported by Department of Energy Office of Fusion Energy Science Contract DE-SC000193 and a gift from the Lam Research Corporation.

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