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Global model of a Dual frequency Capacitive Discharge PIERRE LEVIF, PASCAL CHABERT, LPTP CNRS Ecole Polytechnique, MILES TURNER, Dublin City University — A major attraction of dual-frequency excitation is that it promises independent control of the ion flux and the ion energy. The electron heating mechanisms occurring within the dual-frequency sheath region were recently investigated by Turner and Chabert (Phys. Rev. Letters (2006) **96**, 205001). It was shown that the heating produced by the superposition of the two frequencies is much larger than the sum of the two frequency contributions. In the present paper, we use the heating models developed to construct a global model of a dual-frequency capacitive discharge operated in argon. For this, we must also discuss the dynamics of the sheath to obtain the equivalent of a dual-frequency Child law which relates the applied rf voltage, the electron density and the sheath size. By coupling the power and particle balance to the Child law mentioned above, one can obtain a self-consistent solution for all the plasma parameters. A major result of this model is that ion flux and ion energy are not decoupled since the low-frequency significantly contributes to plasma heating.

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