

Abstract Submitted  
for the GEC16 Meeting of  
The American Physical Society

**Electron heating in the inductive discharge array (IDA): theoretical concept and first measurements** PHILIPP AHR, UWE CZARNETZKI, Institute for Plasma and Atomic Physics, Ruhr-University Bochum — Besides the common stochastic heating effect in inductively coupled plasmas, recently a novel heating mechanism was identified theoretically by Czarnetzki and Tarnev [1]. It considers the movement of electrons in a plane parallel to the induced electric field lines, in contrast to the well-known case, when the considered electrons move perpendicular. To enable the possibility of non-local energy gain for electron in this parallel plane, a periodically structured electric field was proposed. To experimentally verify this hypothesis a new plasma source was designed and assembled. This source is named Inductive Discharge Array (IDA). The special spatial field structure is realized by a large electrode with an array of 6 x 6 small plane inductive coils. Due to the use of two separate electric circuits, both electric field structures mentioned in [1] can be achieved. Here the theoretical background and the relevant design considerations are presented. In addition first experimental results are shown.  
[1] U. Czarnetzki and Kh. Tarnev, *Phys. Plasmas* **21**, 123508 (2014).

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Date submitted: 10 Jun 2016

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