

Abstract Submitted
for the GEC18 Meeting of
The American Physical Society

INCA - Inductive Discharge Array PHILIPP AHR, TSANKO V. TSANKOV, JAN KUHFIELD, UWE CZARNETZKI, Institute for Plasma and Atomic Physics, Ruhr-University Bochum — A novel low pressure inductive discharge and stochastic electron heating concept is demonstrated experimentally for the first time [1]. Here, electrons are collisionlessly heated in a phase-correlated vortex field array, as proposed theoretically in [2]. These periodic vortex fields are produced by an array of 6×6 small inductive planar coils. Easy upscaling to m^2 -size is possible. Design considerations together with results from various diagnostics are presented. The experimental data show consistently efficient and homogeneous plasma production at pressures below 1 Pa as well as the presence of super energetic electrons. The efficient heating is further demonstrated by the velocity distribution of the electrons. The presented results agree well with theory [3]. Possible applications for this new plasma source include large area processing and space propulsion.

[1] Ph Ahr *et al*, submitted to *Plasma Sources Sci. Technol.* (2018), arXiv:1806.02043

[2] U Czarnetzki and Kh Tarnev, *Phys. Plasmas* **21** (2014) 123508

[3] U Czarnetzki, submitted to *Plasma Sources Sci. Technol.* (2018), arXiv:1806.00505

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Date submitted: 18 Jun 2018

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