Contribution ID : **69** Type : **Poster**

Study of electron flow in a pyroelectric accelerator

Tuesday, 22 October 2024 17:05 (115)

By periodically varying the temperature of a pyroelectric single crystal under vacuum conditions, a compact charged particle accelerator can be created [1]. In addition to the single crystal, this also requires a grounded target, which acts as the second electrode in the acceleration scheme. This type of accelerator can be described as quasi-electrostatic. In various modes, this compact device can serve as a monoenergetic source of non-relativistic electrons, ions, X-rays, and even neutrons [2-4].

This paper discusses the phase characteristics, emittance, and focusing of such an accelerator. The study was conducted both experimentally and through numerical simulation. Issues related to avalanche breakdown, which are significant for practical applications, and stability and reproducibility of electron beams are also discussed.

The work of P.G. Shapovalov and A.N. Oleinik was financially supported by a Program of the Ministry of Education and Science of the Russian Federation for higher education establishments, Project No. FZWG-2020-0032 (2019-1569).

References

1. L. E. Garn, E. J. Sharp, J. App. Phys. **83** (1982)
2. G. Rosenman, D. Shur, Ya. E. Krasik, A. Dunaevsky, J. App. Phys. **88** (2000)
3. J. A. Geuther, Y. Danon, J. App. Phys. **97** (2005)
4. J. D. Brownridge, S. M. Shafroth, App. Phys. Letters **85** (2004)

Primary author(s) : SHAPOVALOV, Pavel (National Research Nuclear University ”MEPhI”); OLEINIK, Andrey (BelSU); Dr. KARATAEV, Pavel (John Adams Institute at Royal Holloway, University of London)

Presenter(s) : SHAPOVALOV, Pavel (National Research Nuclear University ”MEPhI”); OLEINIK, Andrey (BelSU)

Session Classification : Poster session

Track Classification : Facilities and advanced detector technologies