

Abstract Submitted
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**Study of Explosive Electron Emission from a Pin Cathode Using
High Resolution Point-Projection X-Ray Radiography¹**

S.A. PIKUZ, T.A. SHELKOVENKO², D.A. HAMMER, Cornell University, E.V. PARKEVICH, I.N. TILIKIN, A.R. MINGALEEV, A.V. AGAFONOV, P. N. Lebedev Physical Institute

— Most studies of Explosive Electron Emission (EEE) are based on the idea of cathode flares developing after explosion of metal whiskers (micron scale pins) on the cathode surface. The physical state of the pin material, the spatial structure of the explosion and its origin are still a matter of conjecture. In this work we used high-resolution point projection x-ray radiography to observe micron scale pin explosion in a high-current diode. Pin cathodes made from 10-25 micron Cu or Mo wires were placed in gaps in return current circuits of hybrid X-pinchs on the XP and BIN pulser. Pin lengths were varied over a range 1-4 mm and pin-anode gaps within 0.05-3 mm. The diode current and voltage were measured. In experiments with small pin-anode gap (0.1 - 1 mm) development of an expanded dense core of the pin was observed except the pin tip with length 100-200 microns indicating significant energy deposition in the wire material. In experiments with bigger gaps there was no visible wire core expansion within the spatial resolution of the experimental technique.

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²Permanent address: P.N.Lebedev Physical Institute

David Hammer
Cornell University

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