Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

High-current plasmas switching devices. ALEKSANDR MUSTAFAEV, ARTIOM GRABOVSKIY, OSCAR MURILLO, St. Petersburg Mining University, VLADIMIR SOUKHOMLINOV, St. Petersburg State University — Nowadays, the level of development of spatial and earthly nuclear energetic lays down big requirements: total control possibility of current density with a stable work of the instrument in extreme conditions with a big radiation level and temperatures of 1000 K. Among the ways of solving this problem the application of key elements with binary cesium-barium plasmas are available. The results of the investigation on electro-kinetic parameters of plasma Knudsen Cs-Ba key element with big current densities are presented in this work:
>The phenomenon of spontaneous current breakage, which has a big influence on the efficiency of the grid extinction, was investigated; >Unique regimes of effective grid extinction, in which the rise of modulated power is realized with a declining of the energetic cost of controlling the current of the key element, were found; >Record energetic parameters for the binary key element were obtained: at an anode potential of 50 V, stable frequencies modulation at 1-10 kHz, the electric power density of 5 kW/cm^2 and the efficiency more than 95%.

ALEKSANDR MUSTAFAEV
St. Petersburg Mining University

Date submitted: 14 Jul 2016 Electronic form version 1.4