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Current Control Capabilities in Unstable Discharge Mode. ALEKSANDR MUSTAFAEV, BORIS KLIMENKOV, ARTYOM GRABOVSKY, Saint-Petersburg Mining University, VICTOR KUZNETSOV, Ioffe Institute RAS — This talk continues studies of the effect of grid current control of cesium-barium vapor current modulator in the unstable mode of plasma discharge, which were presented in [1]. It is shown that the modulator in the non-stationary mode is promising not only from the point of view of limiting parameters, but also from the point of view of control efficiency. Full current modulation is provided by the forming of nonlinear plasma structures during the excitation of the electronic instability of Bursian-Pierce. It is shown that in this mode, in the interelectrode gap, a potential distribution with a virtual cathode is formed, leading to a break of the electron current. In this case, the current in the triode changes almost instantaneously, since the process of the formation of a virtual cathode proceeds over a time of the order of the electron travel time through the gap. This is especially important for the successful practical application of triode modulators. A high electric strength has been implemented, which allows to keep the triode in the locked state after a current break for a long time. The role of the grid is reduced to maintaining the locked state of the triode and ensuring high electric strength. [1] A. Mustafaev, B. Klimenkov, A. Grabovskiy, V. Kuznetsov. 71st Annual Gaseous Electronics Conference, GEC18, 5-9 November 2018. Portland, OR, USA.

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