High-frequency electron beam modulation in a diode with a plasma cathode

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A novel phenomenon of high frequency modulated electron beam generation is presented. Experiment was carried out with an electron diode having active source of the cathode plasma. Modulated electron beam with duration of $\geq 1\mu s$ was generated during more than one hour with a frequency of $2Hz$. The frequency of the modulation was found to be $\geq 325MHz$. The modulation of the beam current amplitude reaches $\geq 30\%$. The generation of the modulated electron beam is accompanied by electromagnetic radiation with the same frequency and power of several tens of kW. Based on the experimental data a qualitative model of the observed phenomenon is described.