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Kinetic Instabilities in Pulsed Operation Mode of a 14 GHz Electron Cyclotron Resonance Ion Source

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The occurrence of kinetic plasma instabilities is studied in pulsed operation mode of a 14 GHz A-ECR type electron cyclotron resonance ion source. It is shown that the temporal delay between the plasma breakdown and the appearance of the instabilities is on the order of 10-100 ms. The most important parameters affecting the delay are magnetic field strength and neutral gas pressure. It is demonstrated that kinetic instabilities limit the high charge state ion beam production in the unstable operating regime.