

OPTIMIZATION OF GASDYNAMIC ECR ION SOURCES

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Abstract

The current work is a continuation of the study of gasdynamic ECR ion sources (ReGIS). The main difference of these sources from classical Geller ECR ion sources is the use of the quasi-gasdynamic regime of plasma confinement in magnetic traps. A possibility of ion beam formation in REGIS with total current of 100 mA and higher was demonstrated in *. Such currents are attained due to small longitudinal lifetime in the quasi-gasdynamic regime of confinement. A drawback of ReGIS is low average ion charge. In the current work possible ways of increasing ion charge are demonstrated. Based on the model described in ** a magnetic trap is optimized and microwave radiation power required for producing a preset average charge is analyzed. The computations are compared with data of experiments. A variant of a magnetic trap and microwave pump designed to obtain pulsed beams of Ar+5 and Xe +15 ions with currents of tens of MA was proposed.

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