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POWER ABSORPTION IN THE PLASMA ION SOURCE OF A HELICON TYPE

The article presents the solution of the power absorption problem in the helicon-type plasma ion source. Ion source used now as an injector of the IAP NASU nuclear microprobe was chosen for calculations. Results were obtained for hydrogen and helium plasma. Cylindrical plasma source is placed in the external longitudinal (along the cylinder axis) uniform magnetic field. Working frequency of the source ω is in the range of $\omega_{ci} < \omega < \omega_{ce} < \omega_{pe}$ and $\omega = 2 \cdot \pi \cdot f$ (rad/s); $f = 27{,}12\ \text{MHz}$. The values of the uniform external magnetic field, when the power absorption is maximum, were obtained for various plasma densities.

Keywords: helicon plasma ion source, injector, nuclear microprobe, Trivelpiece - Gould wave.