Abstract Submitted
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2D fluid simulations of two-chamber ICP electronegative plasma source[1] ANATOLY KUDRYAVTSEV, EUGENE BOGDANOV, St.Petersburg State University, KONSTANTIN SERDITOV, St.Petersburg State Polytechnical University — Two-dimensional fluid simulations of two-chamber oxygen ICP sources with conductive walls are presented. The external power is applied to the first, active discharge chamber and formed plasma extends in the second, expanding chamber. It is found that in two-chamber ICP plasma sources spatial distributions of charged particles densities and fluxes are very complicated. Due to spatial inhomogeneity of the plasma density and the electron temperature, the considerable electron vortex current arises. As a result the electron transport is not ambipolar and electron flux doesn't equal to the ion ambipolar flux at any point of discharge volume. It is found that even a direction of electron flux is different in different parts of the boundary cross-section between chambers. Also shown that because negative ions are repelled by any object inserted into the plasma, probe holder strongly affects on negative ions spatial distributions. This can lead to errors in measurements of negative ions parameters by any laser photodetachment technique in its combination with probe measurements.

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