Abstract Submitted
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Modeling and experiments in argon-oxygen rf ICP pulse plasma.[1] VLADIMIR DEMIDOV, UES, inc, EVGENY BOGDANOV, ANATOLY KUDRYAVTSEV, KONSTANTIN SERDITOV, St. Petersburg State University, CHARLES DEJOSEPH, JR., AFRL — Numerical modeling of an argon-oxygen pulsed discharge (active phase and afterglow) has been performed for a specific device [W. Guo and C. A. DeJoseph, Jr., PSST, 10, 43 (2001)] for a number of experimental conditions. Spatiotemporal behavior of densities of plasma species, as well as fluxes of charged particles including fast electrons, have been calculated. It is demonstrated that in the afterglow of the plasma, production of fast electrons from both electron detachment of oxygen negative ions and from collisions involving argon metastable atoms can be very important. Conditions for self-trapping of these fast electrons have been identified. Measured values of charged particle densities agree reasonably well with calculations. The influence of the presence of the probe on measurements of negative ion densities has been also investigated. A simple method of regulation of negative ion densities and spatial distribution will be presented.

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