

Particle simulation for potential profile calculation in RF induced volume-type H⁻ ion source

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The potential profile in hydrogen negative ion source is very important for extraction of the negative ions. The motion of volume-produced negative ions is dominated by the electric field, which is determined by the potential gradient. Hence, the potential profile is crucial for the negative ion extraction. In this study, the potential profile was calculated by using particle simulation code. The simulation takes into account positive-biasing electrode effect and also filtering magnetic field effect, which is required for separating plasma into cold and hot electron temperature regions. Calculation results shows the effects of the biasing and filtering magnetic field on potential profile. From the results, we suggest a better biasing electrode condition and magnetic field profile