

Discharge Simulation of IEC with the ion source

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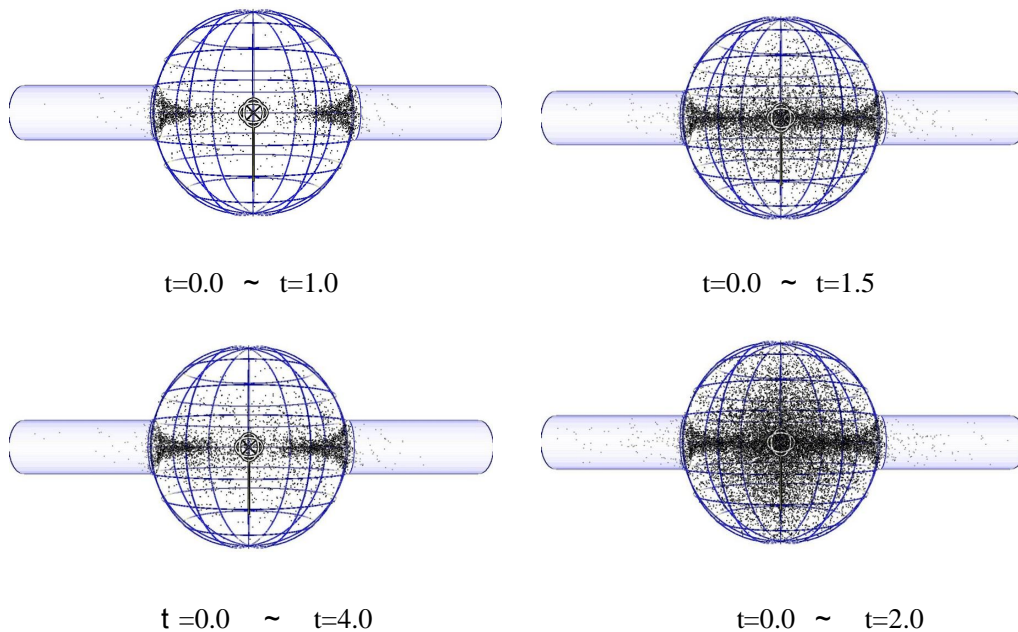
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In this study, The model of the IEC device which is used at Kansai University now are simulated. The three-dimensional Monte Carlo particle in cell code including the atomic processes is used for investigation of the difference of discharge characteristics when ion source is used or not.

From the results of these calculations , when the ion source is used, the change of the increase of the charged particle does not depend on gas pressure very much.

Regardless of using ion source or not , the rate of atomic and molecular reactions in the discharge is almost same. The existence rate of D_2^+ is the highest , and there is much neutron generation by D_2^+ on the condition with ion source or without.

In the both situations , the initial plasma density is assumed as same in this simulation(voltage -80kV gas pressure 0.55Pa). From the results of these calculations , when the ion source is used, the neutron production rate is 2times larger.



One of reaction equation of D_2^+ ($D_2^+_{(beam)} + D_{2(back)} \rightarrow D_2^0_{(beam)} + D_2^+_{(slow)}$) are shown.