Abstract Submitted
for the GEC06 Meeting of
The American Physical Society

γ action of metastable atom in Ar micro gap SUSUMU SUZUKI, HARUO ITOH, Chiba Institute of Technology — To separate γ process that consisted of γi, γm andγp, Monte Carlo simulation (MCS) was performed[1] for the preparation. Generated numbers of ion, metastable atom and photon were calculated, and the feedback effect of those particles was investigated. It was ensured that the ratio of the ion returned to the cathode occupies 71% among the sum of those particles. Therefore, it was considered that main action of γ was γi by the ion returning to the cathode. However, it is evident that the metastable Ar having the long lifetime and high potential energy higher than 10 eV occupies 11% among the three kinds of particle. Therefore it is necessary to consider about the attribution of metastable atom for γ action. Rate of metastable Ar that arrives to the cathode is calculated from the solution of the diffusion equation[2] that can take account of the reflection of metastable Ar on the surface of electrodes. The diffusion coefficient of metastable Ar[3] and the collisional quenching rate coefficient[3] of metastable Ar by Ar in ground state are used for the estimation. The reflection coefficient[2] of metastable Ar at the electrodes is calculated as 0 using a boundary condition of the third kind. Approximately 30% of the metastable Ar enters the cathode. Therefore, the influence on the current by the γ action of the metastable Ar is small, but it can not be neglected. [1] S.Suzuki and H.Itoh: submitted to Jpn. J. Appl. Phys. [2] S.Suzuki, H.Itoh, N.Ikuta and H.Sekizawa: J. Phys. D, **25** (1992) 1568-1573. [3] A.H.Futch and F.A.Grant: Phys.Rev., **104** (1956) 356-361.

Susumu Suzuki
Chiba Institute of Technology

Date submitted: 16 Jun 2006 Electronic form version 1.4