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On judgement of electron transfer between two regions divided by the separatrix of confronting divergent magnetic fields applied to an inductively coupled plasma[1] HIROTAKE SUGAWARA, TAPPEI YAMAMOTO, Hokkaido University — In order to quantitatively evaluate the electron confinement effect of the confronting divergent magnetic fields (CDMFs) applied to an inductively coupled plasma,[2] we analyzed the electron transfer between two regions divided by the separatrix of the CDMFs in Ar at 0.67 Pa at 300 K using a Monte Carlo method. A conventional transfer judgement was simply based on the electron passage across the separatrix from the upstream source region to the downstream diffusion region. An issue was an overestimation of the transfer due to temporary stay of electrons in the downstream region. Electrons may pass the downstream region during their gyration even in case they are effectively bound to the upstream region, where their guiding magnetic flux lines run. More than half of the transfers were temporary ones and such seeming transfers were relevantly excluded from the statistics by introducing a newly chosen criterion based on the passage of electron gyrocenters across the separatrix and collisional events in the downstream region. Simulation results showed a tendency that the ratio of the temporary transfers excluded was higher under stronger magnetic fields because of higher cyclotron frequency.

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[2]T. Tsankov and U. Czarnetzki 2011 IEEE Trans. Plasma Sci. **39**, 2538.

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