Analysis of the potential oscillation in Hall thrusters with a two-dimensional particle-in-cell simulation parallelized with graphic processing units[1] MIN YOUNG HUR, HO-JUN LEE, HAE JUNE LEE, Pusan National University, WON HO CHOE, KAIST, JONG HO SEON, Kyung Hee University — Oscillations of the plasma potential have been observed in many Hall thruster experiments. It was estimated that the oscillations are triggered by the interaction between the plasma and the dielectric materials such as secondary electron emission, but detailed mechanism has not been proven. In this paper, the effects of the interaction between the plasma and dielectric material are simulated with a two-dimensional particle-in-cell (PIC) code for the acceleration channel of the hall thruster. Especially, the simulation code is parallelized using graphic processing units (GPUs). To analyze the effect, the simulation is confirmed to change following two parameters, magnetic flux density and secondary electron emission coefficient (SEEC). The particle trajectory is presented with the variation of the SEEC and magnetic flux density as well as its curvature.

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