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Charging potential fluctuation induced by point particle effect in a sub-10 nm trench TAESANG LEE, YONGSEOK JHO, Korea Advanced Institute of Science and Technology, SEONGSIK KIM, National Fusion Research Center / Korea Advanced Institute of Science and Technology, CHOONGSEOCK CHANG, Korea Advanced Institute of Science and Technology / New York University — Monte Carlo simulation of charging process in a sub 10nm trench shows that charging potential fluctuation increases up to the level of incident ion energy. Size dependence of charging fluctuation is observed. Trench systems with different width are selected as reference systems to see the characteristics for this phenomena. Summation formula is derived for coulomb interaction in a 2D periodic system instead of solving Poisson equation with conventional FEM or FDM method. It is observed that charging fluctuation increases as the trench size decreases. The relation between these fluctuations and ion energy distribution on the trench bottom is finally shown which may affect on etching process.

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