

## Comuputer simulation on the structure of double layer in the auroral accerlation region

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Electric fields due to the electric double layers in the auroral acceleration region were first observed in 1970's (Mozer et al. 1977). The FAST observation showed a multi-dimensional structure of the auroral double layer (Ergun et al. 2001). The previous one-dimensional Vlasov simulation of a current-carrying plasma showed that a double layer was driven by a density depression (Newman et al. 2001). However, multi-dimensional kinetic simulations have not been performed yet due to both computational resources and computational techniques. In the present study, we first perform a two-dimensional particle-in-cell simulation of a current-carrying plasma with a density depression to reproduce multi-dimensional structures of electric field in the auroral acceleration region.