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Theory of low-frequency electron fluctuations in a quasi-ballistic FET

Tuesday, 16 January 2024 15:25 (20 minutes)

We investigated the electronic processes in a field effect transistor channel using shallow water approximations to obtain the analytical expressions for electron and field distributions, as well as electric fluctuations using the Langevin approach. We considered the current-voltage characteristic of the transistor in the stationary mode. For the non-stationary case, we obtained the spatial distributions of the spectral fluctuations density for different parameters of the channel, and the dependence of these values on the stationary parameters. We considered two modes of measuring transistor characteristics with a fixed voltage or current.

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