Abstract Submitted
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Large contact noise in graphene field-effect transistors[1] PARITOSH KARNATAK, PHANINDRA SAI, SRIJIT GOSWAMI, SUBHAMOY GHATAK, Indian Inst of Science, SANJEEV KAUSHAL, Tokyo Electron Ltd., ARINDAM GHOSH, Indian Inst of Science — Fluctuations in the electrical resistance at the interface of atomically thin materials and metals, or the contact noise, can adversely affect the device performance but remains largely unexplored. We have investigated contact noise in graphene field effect transistors of varying device geometry and contact configuration, with channel carrier mobility ranging from 5,000 to 80,000 $cm^2V^{-1}s^{-1}$. A phenomenological model developed for contact noise due to current crowding for two dimensional conductors, shows a dominant contact contribution to the measured resistance noise in all graphene field effect transistors when measured in the two-probe or invasive four probe configurations, and surprisingly, also in nearly noninvasive four probe (Hall bar) configuration in the high mobility devices. We identify the fluctuating electrostatic environment of the metal-channel interface as the major source of contact noise, which could be generic to two dimensional material-based electronic devices. arXiv:1611.01181.

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