Abstract Submitted
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The Low Frequency Noise Spectrum in Gated Epitaxial Graphene Field Effect Transistors[1] D. KURT GASKILL, U.S. Naval Research Laboratory, H.K. CHAN, Newcastle University, V.D. WHEELER, U.S. Naval Research Laboratory, V.K. NAGAREDDY, Newcastle University, L.O. NYAKITI, Texas A&M University - Galveston, TX, A. NATH, George Mason University, R.L. MYERS-WARD, Z.R. ROBINSON, N.Y. GARCES, U.S. Naval Research Laboratory, M.V. RAO, George Mason University, J.P. GOSS, N.G. WRIGHT, Newcastle University, C.R. EDDY, JR., U.S. Naval Research Laboratory, A.B. HORSFALL, Newcastle University — The low frequency noise (LFN) spectrum characteristics in ungated and gated *ca.* 1 ML graphene field effect transistor structures are presented. Synthesis was via the Ar ambient method in a commercial reactor on semi-insulating on-axis 6H(0001)SiC. Samples were processed using photolithography before dielectric deposition; Ti/Au stack was used for ohmic and gate contacts. High-κ dielectric deposition used F-functionalization followed by atomic layer deposition of 15 nm Al_2O_3 or HfO_2. The LFN data was averaged over 5 different samples on the same substrate for each oxide case. The LFN spectrum, proportional to 1/f, was similar in magnitude for both bare and dielectric covered graphene, implying the F-functionalization process does not appreciably add noise generation-recombination centers. Both gate oxides showed noise hysteresis ($\sim$ 15%) although it was more pronounced for the HfO_2 devices. The LFN increased with increasing carrier concentration but decreased with increasing mobility implying that the empirical Hooge model cannot explain the origin of the noise and points to carrier scattering mechanisms as the noise source.

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