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**Method of obtaining graphene and graphene-based electronic components and circuits with pencil directly on paper** ARAM MAILIAN, Institute for Informatics, MANVEL MAILIAN, LTX-Credence Armenia, GAGIK SHMAVONYAN, State Engineering University of Armenia — An easy method of obtaining graphene and graphene-based electronic components and circuits by drawing lines or repeatedly rubbing any type of graphite rod along the same path directly on paper and other insulating substrates is suggested. The structure containing rubbed-off layers behaves like a semiconducting material. The surface of the structure demonstrates ordered and oriented character containing few layer graphene. The carrier mobility is anisotropic through the thickness of the structure with the highest value of $\sim 10^4$ cm$^2$/V·sec at the surface. Raman spectra of the structures in the near IR at excitation wavelength of 976 nm (1.27 eV) are registered. The observed phenomenon is universal, does not depend on the material of the substrate and could find a widespread application. For example, the junction between two rubbed off layers with different mobilities exhibits a non-Ohmic behavior. I-V characteristic of the junction is symmetrically curved with respect to 0 V. The greater is the difference between the carrier mobility, the higher is the curvature. The dynamic accumulation of the carriers in both sides of the junction creates a barrier responsible for non-Ohmic behavior.

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