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Magnetotransport properties of graphene devices contacted by resist-free stencil lithography[1] ATHER MAHMOOD, Institut de Physique et Chimie des Matériaux de Strasbourg, UMR 7504 CNRS, 23 rue du Loess, 67034 Strasbourg, France, CHEOL-SOO YANG, WON JIN CHOI, Advanced Materials Division, Korea Research Institute of Chemical Technology, Daejeon 305-343, Korea (ROK), JEAN-FRANÇOIS DAYEN, Institut de Physique et Chimie des Matériaux de Strasbourg, UMR 7504 CNRS, 23 rue du Loess, 67034 Strasbourg, France, JEONG-O LEE, Advanced Materials Division, Korea Research Institute of Chemical Technology, Daejeon 305-343, Korea (ROK), BERNARD DOUDIN, Institut de Physique et Chimie des Matériaux de Strasbourg, UMR 7504 CNRS, 23 rue du Loess, 67034 Strasbourg, France, IPCMS, UMR 7504, CNRS, STRASBOURG TEAM, AMD, KRICT, DAEJEON, KOREA COLLABORATION — We demonstrate large-scale fabrication of high-quality contaminant-free graphene devices, a prerequisite for chemical functionalization applications. We investigate CVD graphene transferred from Cu substrates to Si/SiO_2. Patterning of graphene and metal evaporation are performed through a multi-step mechanical stencils methodology. Microlithography through stencil masks is well known, but patterning graphene while keeping its outstanding electrical properties remains challenging. Magnetotransport measurements at low temperature show the existence of Shubnikov-de Hass oscillations and Quantum Hall plateaus. Weak (anti-) localization signatures of monolayer graphene validate the excellent intrinsic properties of our samples. Finally, we show this technique is extended to complex geometries and smaller device feature sizes.

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