Development of superconducting interference device based on graphene

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Graphene, an atomic layer of graphite, has been attracted attention since the discovery of methods to extract it. When graphene is placed between two superconducting leads, it can support Cooper pair transport by the superconducting proximity effect. Here, we report on the fabrication and operation of graphene-based superconducting interference device (SQUID). The SQUID consists of two superconductor/single layer graphene/superconductor (SGS) junctions connected in parallel on a superconducting loop made of aluminum. Current-voltage characteristic of the device exhibits supercurrent flowing through SGS junctions at $T = 35$ mK. The critical current can be modulated periodically with the applied magnetic field. The observed period coincides well with that estimated from device geometry, suggesting that our device works as a graphene-SQUID.