

Laser direct writing of 3D graphene patterns inside polymer

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In this paper, a laser internal writing technique is reported to form 3D graphene patterns in polysulphone. , With the control of the focal position below the surface of the polymer, a 3D diagonal surface was formed from bottom to top, avoiding the blockage of the laser beam from graphene features. The influence of laser repetition rate, average power and hatch distance on the quality of the graphene was investigated. Raman spectroscopy and electrical conductivity measurements were carried out to understand the material properties. The technique has the potential to be applied for 3D electrical circuit manufacturing.