Graphene-Based High Performance Infrared Photodetectors

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Graphene field effect transistors (GFETs) are exquisitely sensitive charge detectors, that can be functionalised with additional layers to create a wide range of transducer devices such as biosensors or optical sensors. By application of nanostructured optical absorbers, infrared optical detectors having performance comparable to existing InGaAs photodetectors, but with broader wavelength sensitivity have been created. For longer wavelength, thermal imaging, graphene-based bolometer sensors have been created that have a temperature coefficient of resistance up to 900% K^{-1}.
The detectors can be integrated onto flexible polymeric substrates and standard CMOS wafers to utilise existing silicon microfabrication processes for the signal processing and data capture and keep unit costs low. However, there are many materials integration challenges must be solved to enable the reliable, repeatable manufacture of these graphene based sensors in commercial volumes. In this talk we describe some of the latest results and challenges in fabricating these novel photodetectors.

References

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