**Stretchable broadband photodetector based on layered Black Phosphorus**

*Mei Xian LowA,B, Sumeet WaliaA,B, Sruthi KuriakoseA,B, Taimur AhmedA,B, Madhu BhaskaranA,B, Sharath SriramA,B*

AFunctional Materials and Microsystems Research Group, RMIT University, Melbourne, Australia.

BSchool of Electrical and Computer Engineering, RMIT University, Melbourne, Australia

**Abstract**

Two-dimensional (2D) materials is a unique class of materials whose properties can be manipulated through lateral strain without altering the chemical composition of the material. This calls for the need to realise 2D materials onto soft elastomers, especially on stretchable platforms where strain can be tuned. 2D materials which has been incorporated onto stretchable substrates (PDMS, Ecoflex) thus far are mainly through composite mixing1, spray-casting2 or transfer process3, which may alter the properties of the 2D material, or require lengthy fabrication processes. Here, we demonstrated direct fabrication of black phosphorus (BP) devices on PDMS through surface adhesion modification and controlled fabrication conditions, without the need for additional transfer or etching processes. This allows us to electrically characterize pristine layered BP on a stretchable substrate and observe its broadband optoelectronic response without absorption effects from the underlying substrate, with possible prospects of studying the effect of strain on its optoelectronic properties as well.

**References**

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