

Van der Waals heterostructures under hydrostatic pressure

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The electronic properties of van der Waals (vdW) heterostructures can be markedly different from that of the component layers due to the interaction between them. This interaction can be tuned by modifying the interlayer distance, which can be realised by the application of hydrostatic pressure. This can be considered as a new experimental knob to engineer the band structure of such heterostructures. However, the experimental realisation of transport measurements on vdW heterostructures under hydrostatic pressure is challenging.

Here, I present a robust measurement method to conduct such measurements based on a designer printed circuit board, which is compatible with wire-bonding [1]. Using this technique, I demonstrate how it can be used to modify the properties of various vdW heterostructures, e.g., enhancing and stabilizing of a spin-orbit interaction induced inverted phase in graphene/WSe₂ [2,3], tailoring the band structure of twisted double bilayer graphene [4], or modifying the topological state in ZrTe₅ [5].

References

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