

Measuring Hall viscosity of graphene's electron fluid

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An electrical conductor subjected to a magnetic field exhibits the Hall effect in the presence of current flow. In our work [1] we report a qualitative deviation from the standard behaviour in electron systems with high viscosity. We find that the viscous electron fluid in graphene responds to non-quantizing magnetic field by producing an electric field opposite to that generated by the ordinary Hall effect. The viscous contribution is substantial and identified by studying local voltages that arise in the vicinity of current-injection contacts. We analyse the anomaly over a wide range of temperatures and carrier densities and extract the Hall viscosity, a dissipationless transport coefficient that was long identified theoretically but remained elusive in experiments.

References

- [1] A. I. Berdyugin *et. al.*, Science 10.1126/science.aau0685 (2019)