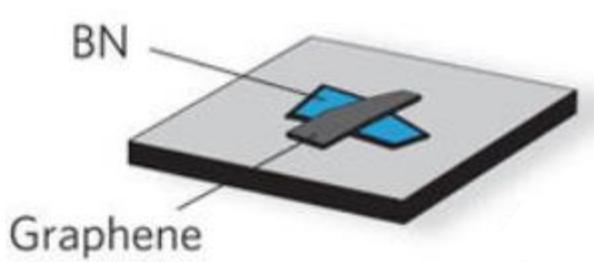


Collimated Ballistic Miniband Transport in a Graphene Superlattice

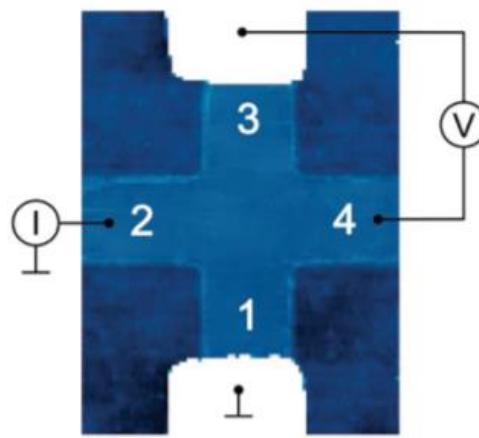
Aaron Sharpe, A. Barnard, J. Wallbank,
K. Watanabe, T. Taniguchi, D. Goldhaber-Gordon

March Meeting 2018

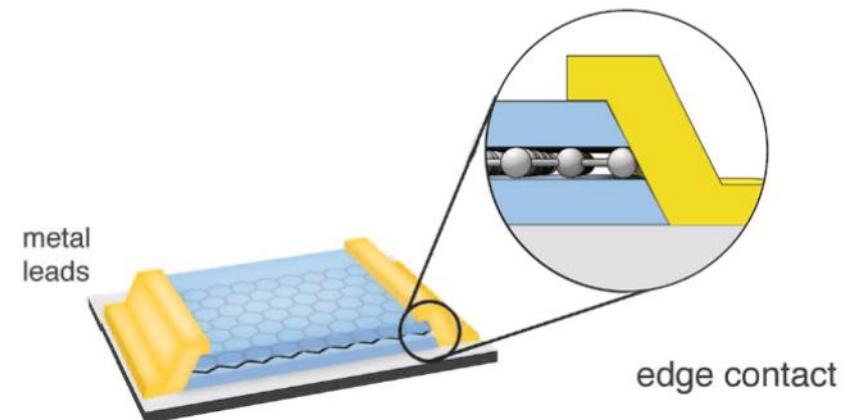
New World of Pristine Graphene



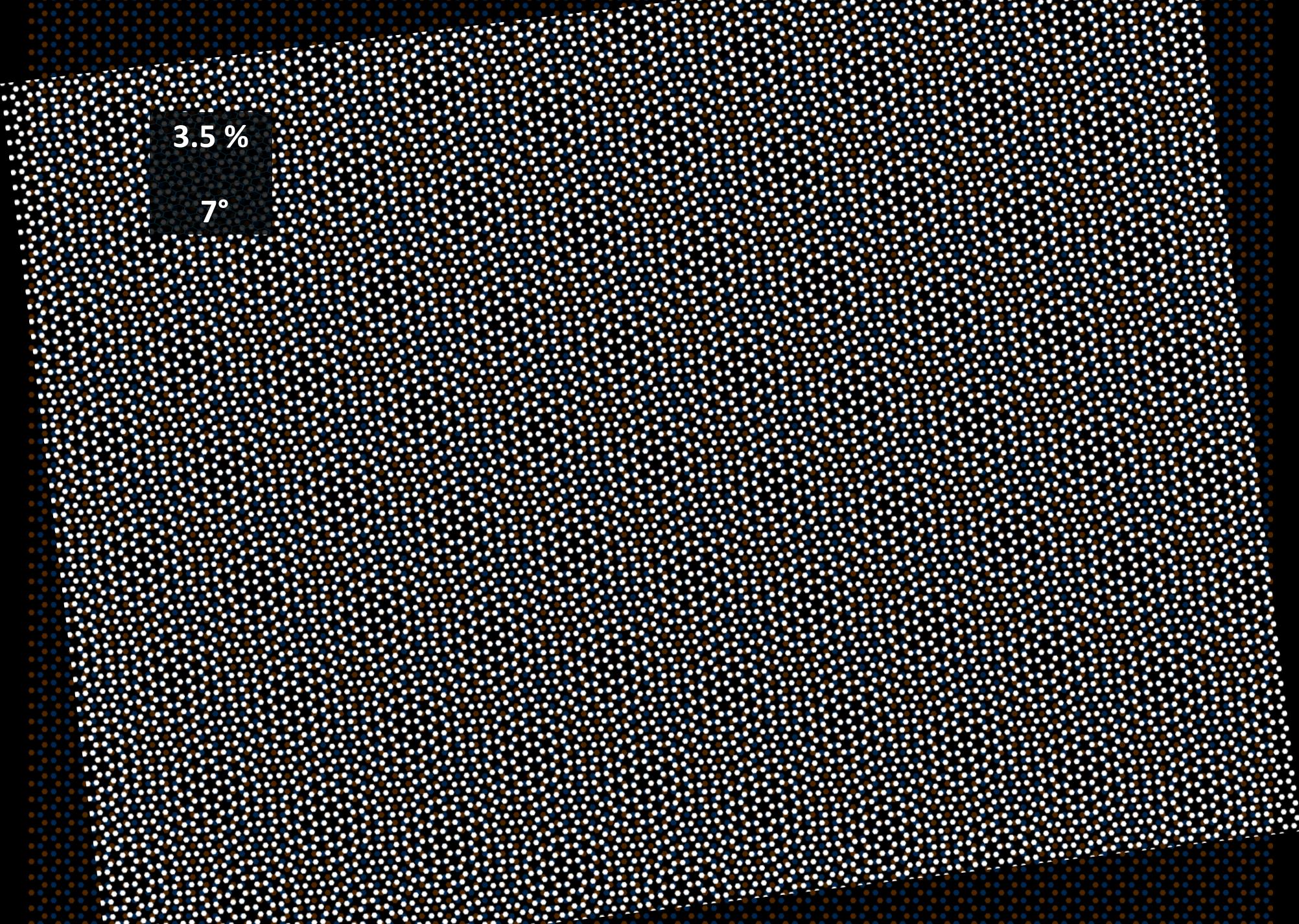
C. Dean, *et al.* Nat. Nano. (2010)



AS Mayorov, *et al.* Nanoletters (2011)

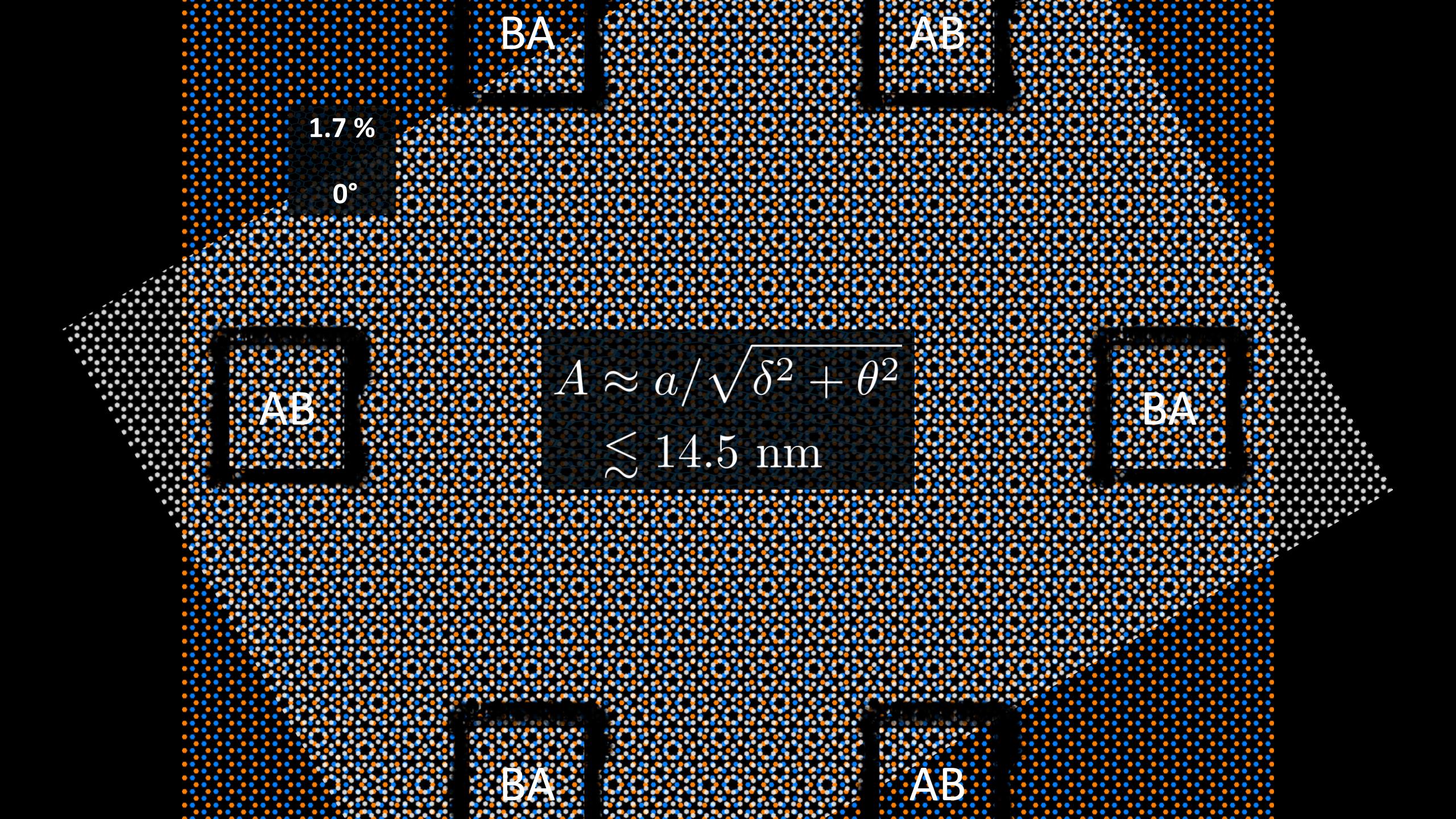


L. Wang and I. Meric, *et al.* Science (2013)



3.5 %

7°



BA

AB

1.7 %

0°

AB

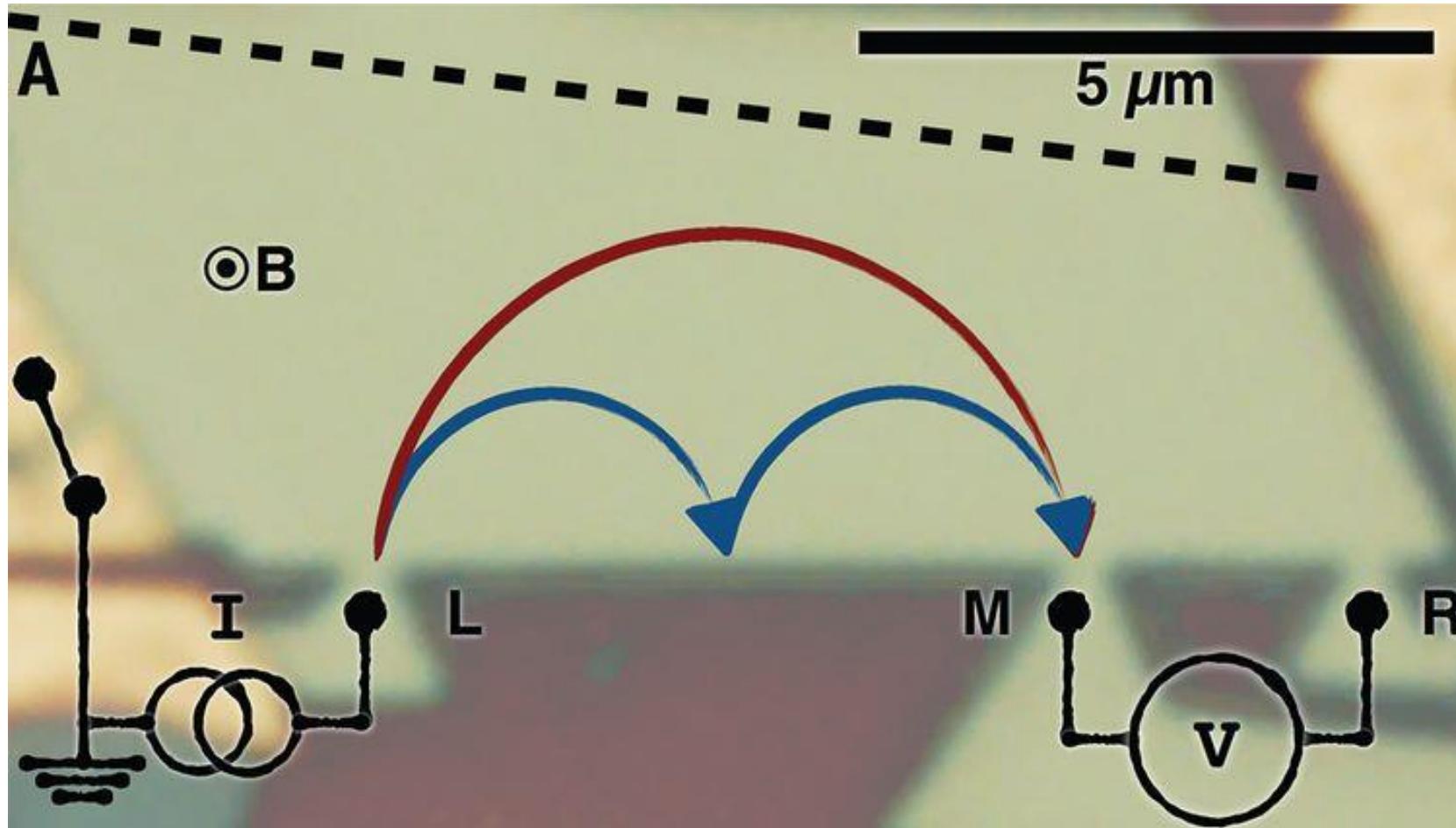
$$A \approx a / \sqrt{\delta^2 + \theta^2}$$
$$\lesssim 14.5 \text{ nm}$$

BA

BA

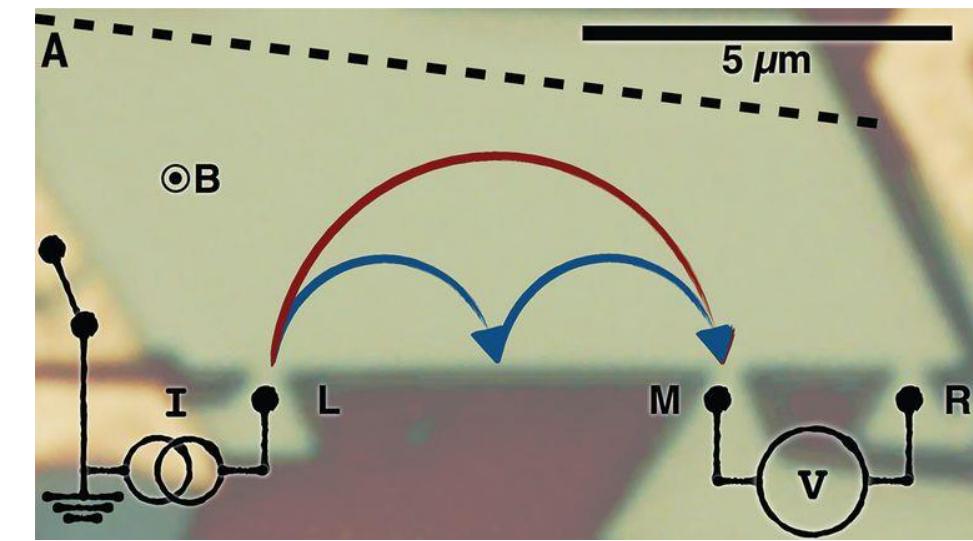
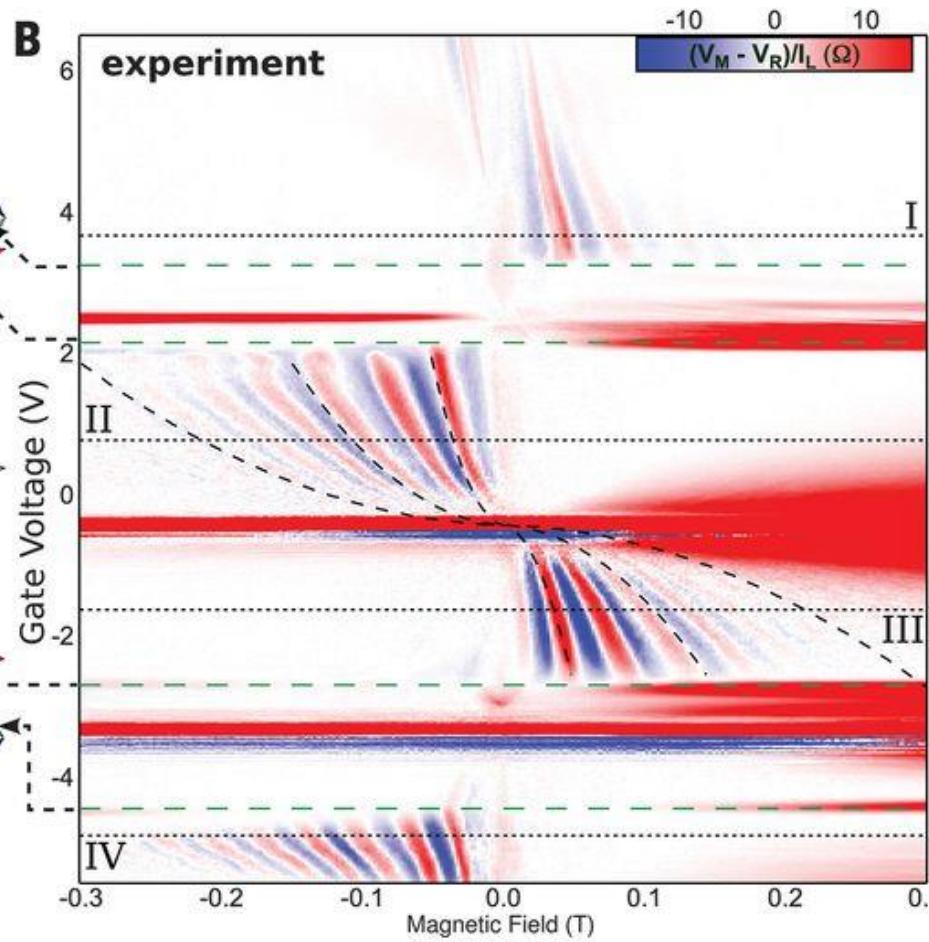
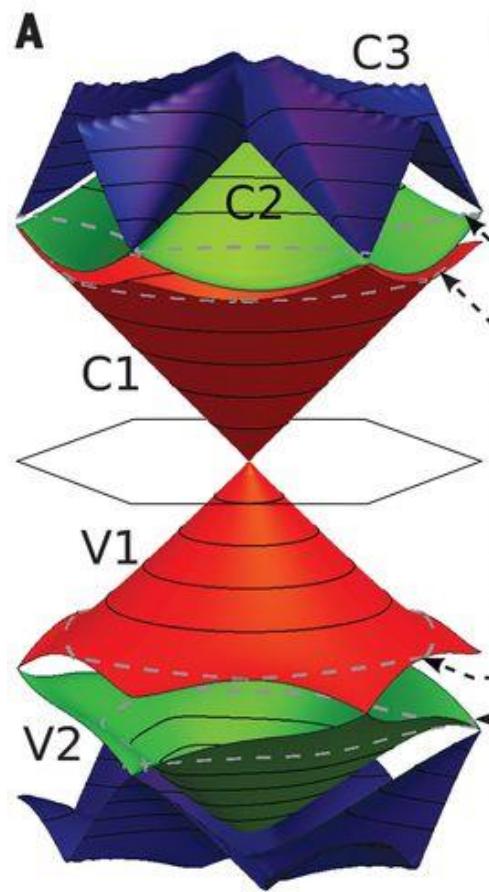
AB

Ballistic Miniband Conduction

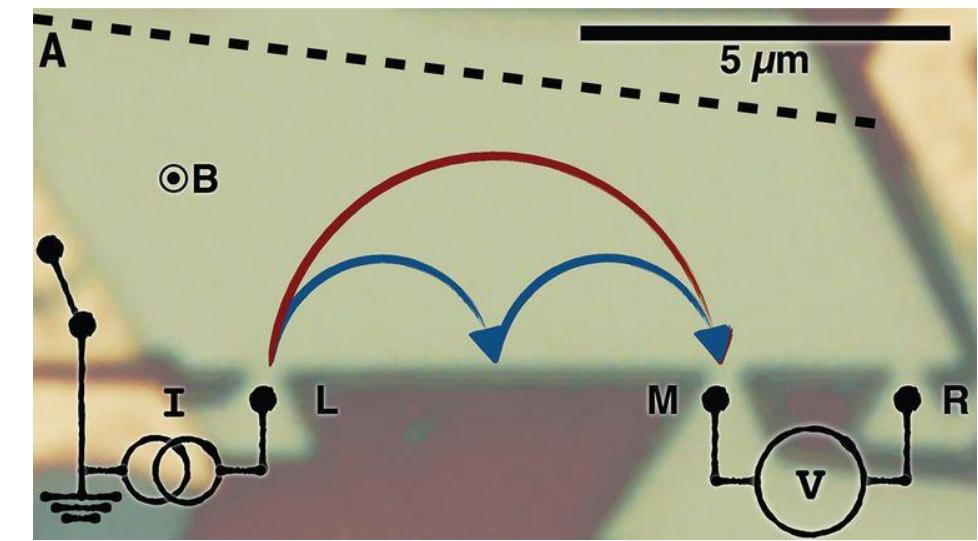
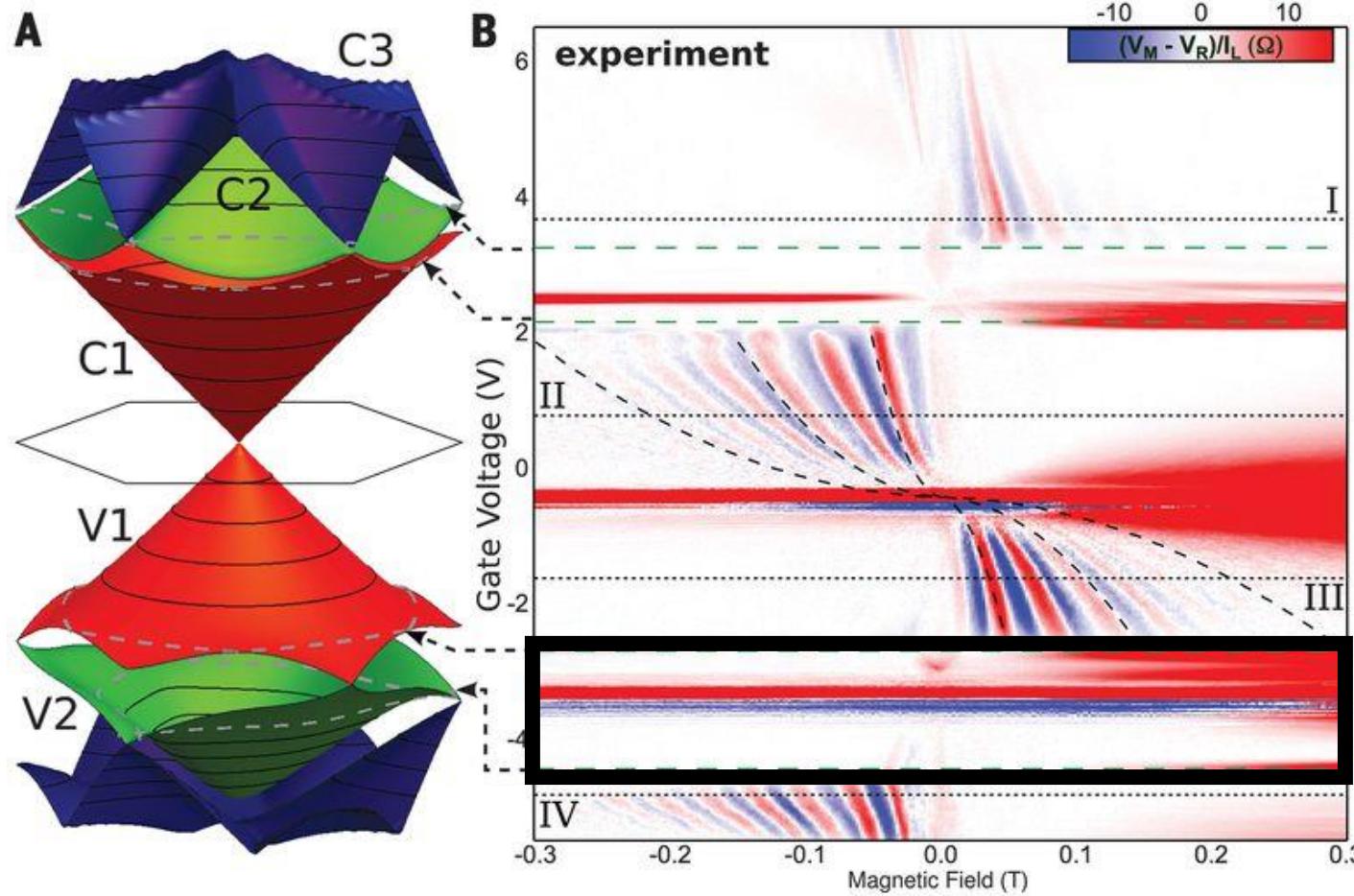


M. Lee et al. *Science* (2017)

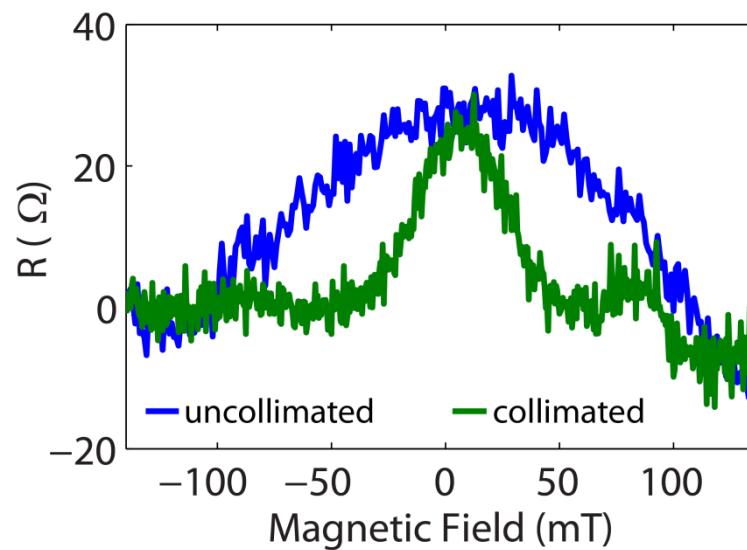
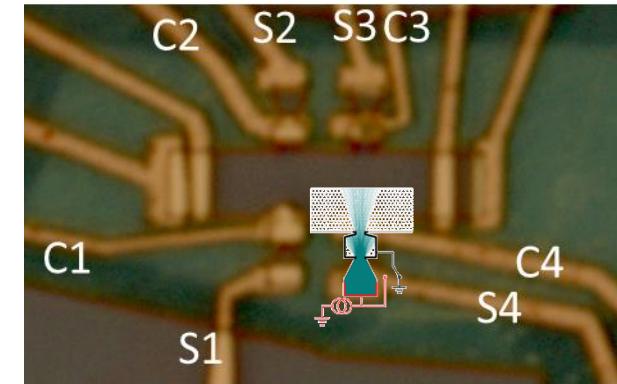
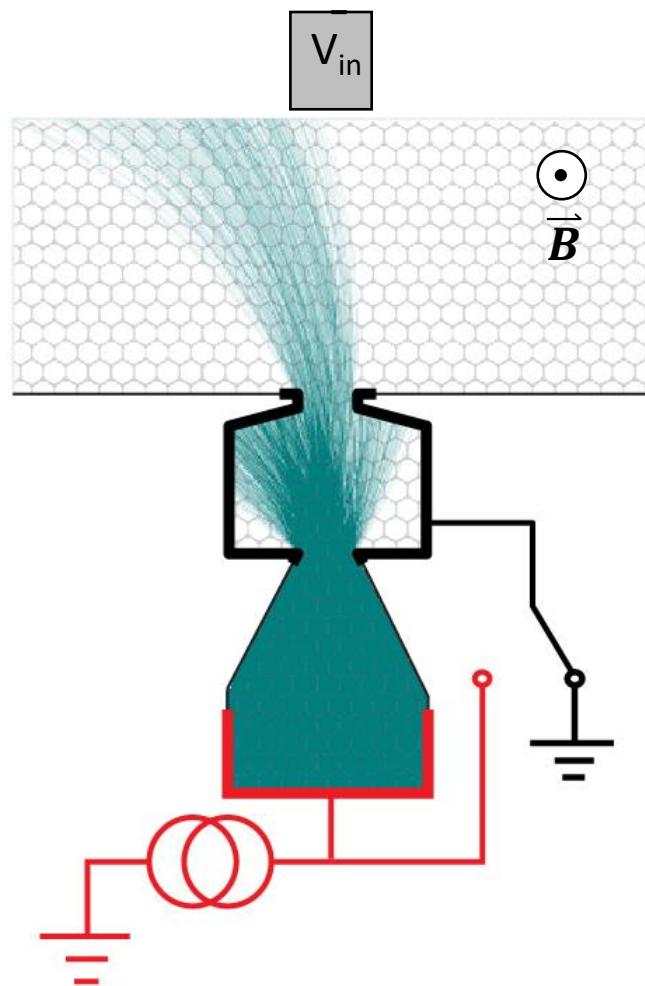
Ballistic Miniband Conduction



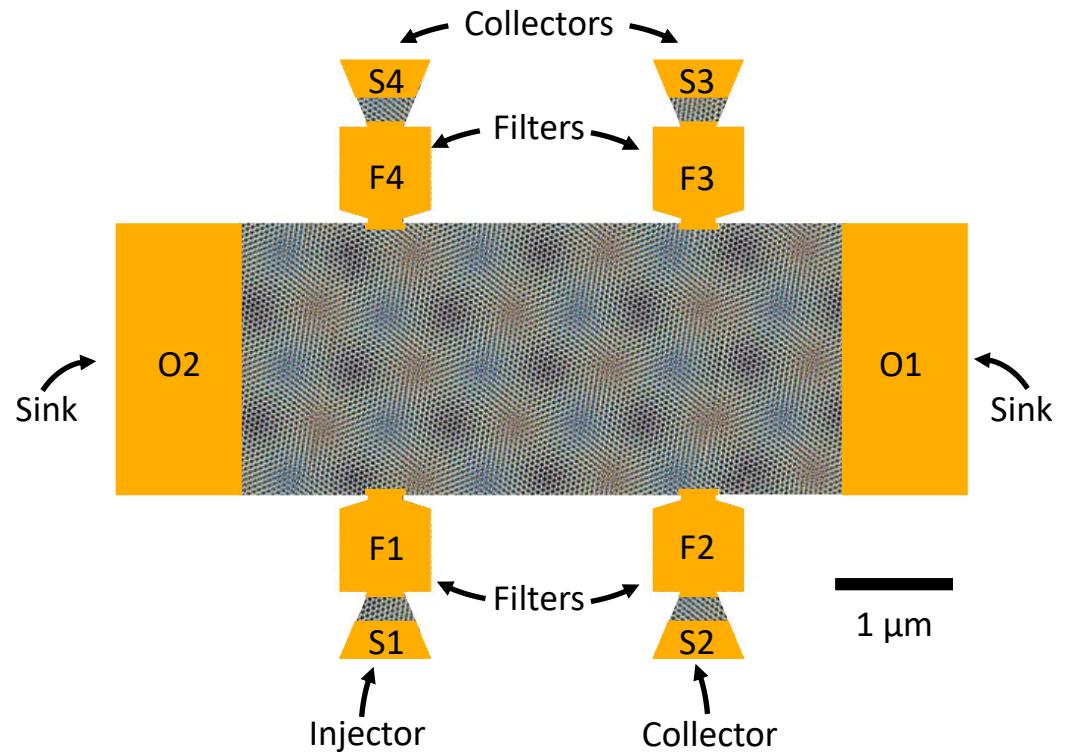
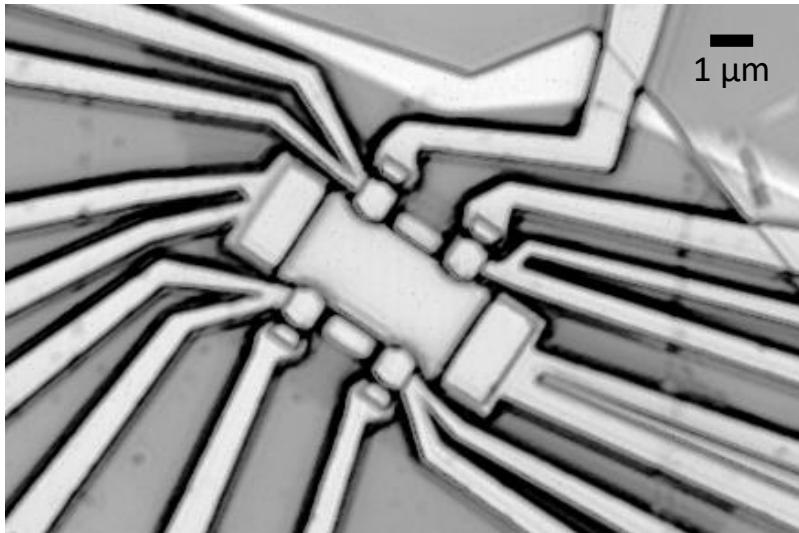
Ballistic Miniband Conduction



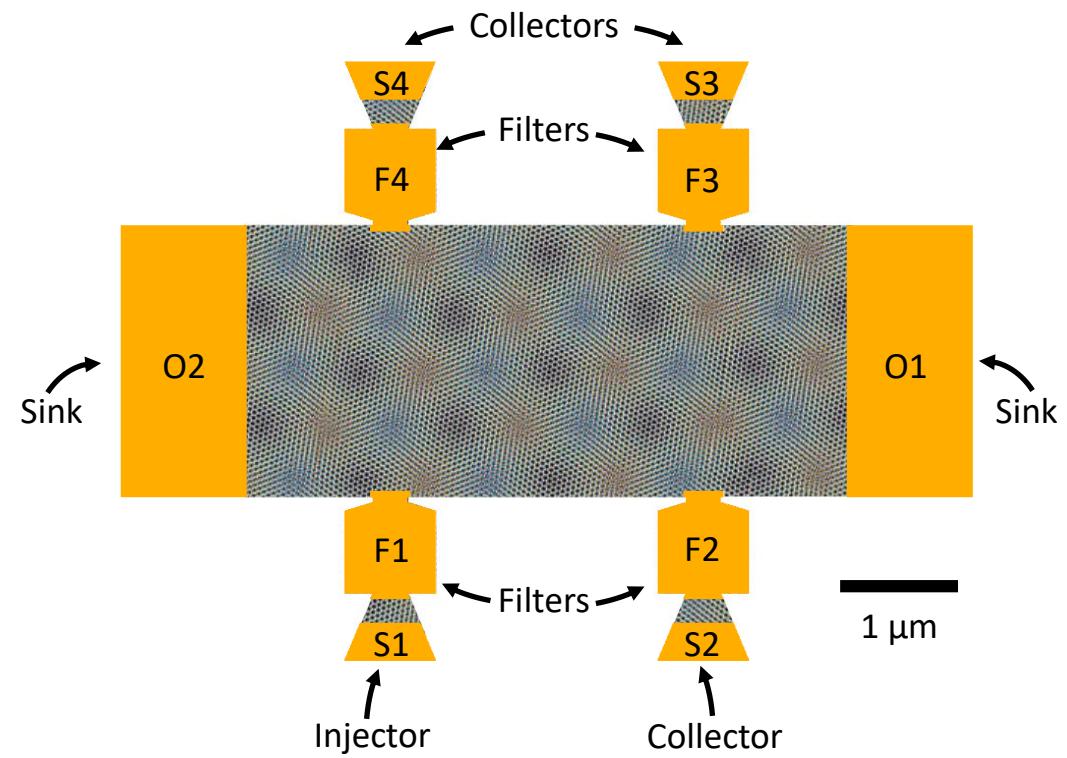
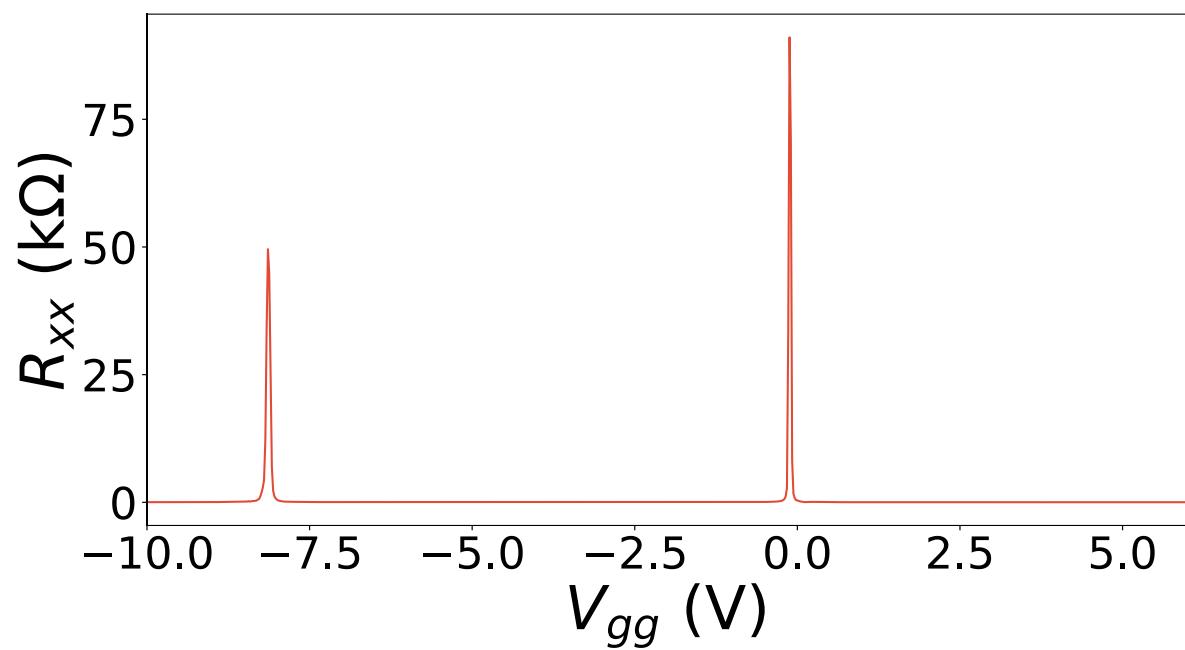
Absorptive Pinhole Collimators for Ballistic Dirac Fermions



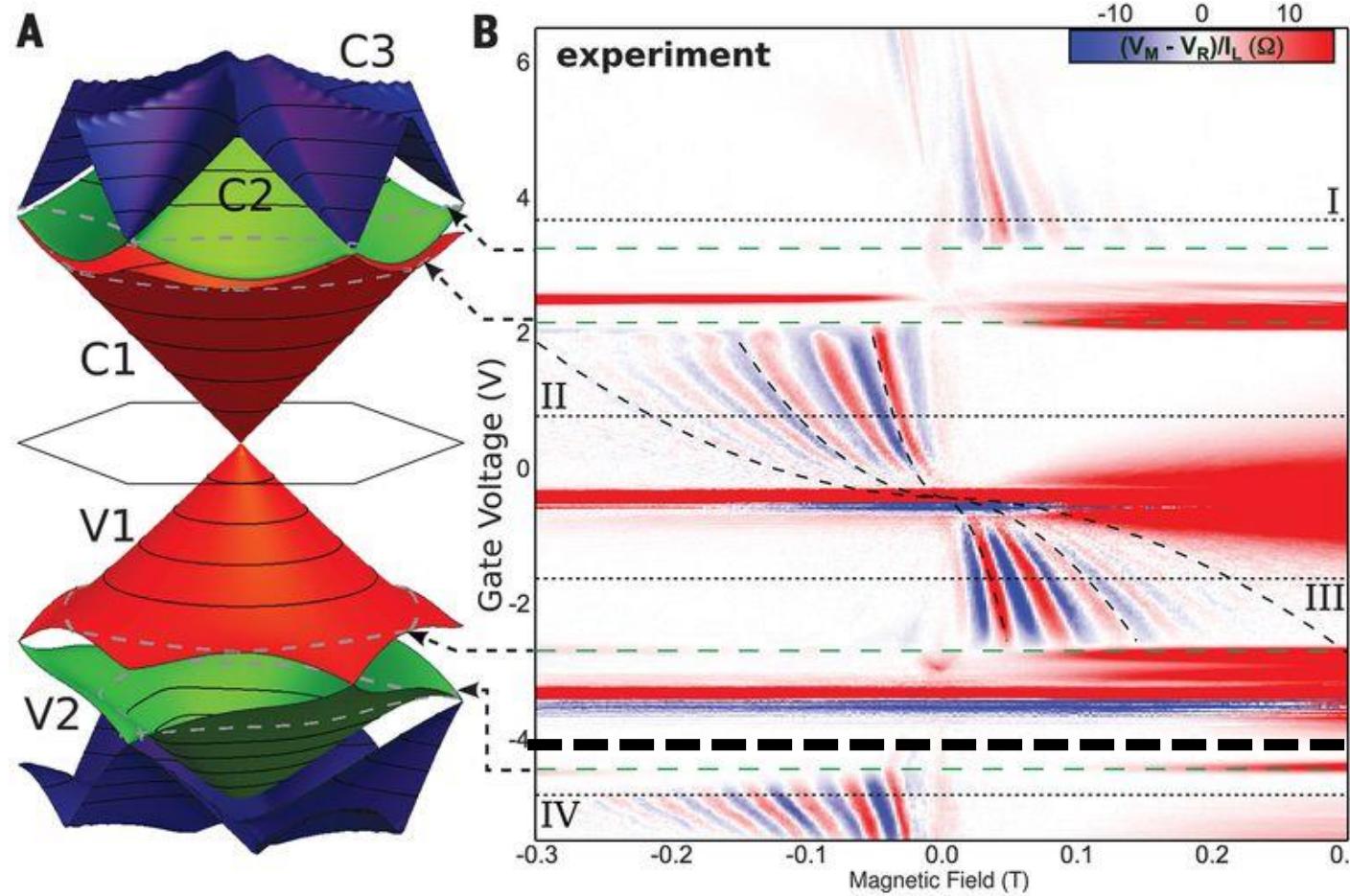
Superlattice Collimator



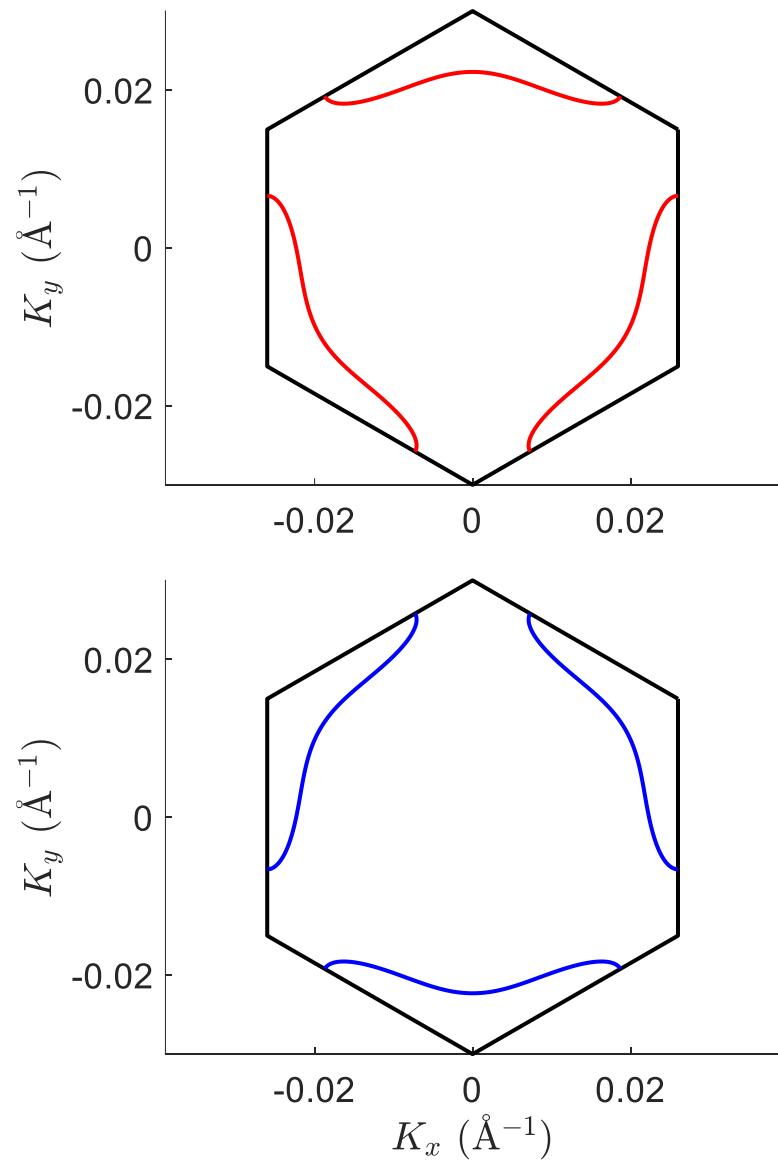
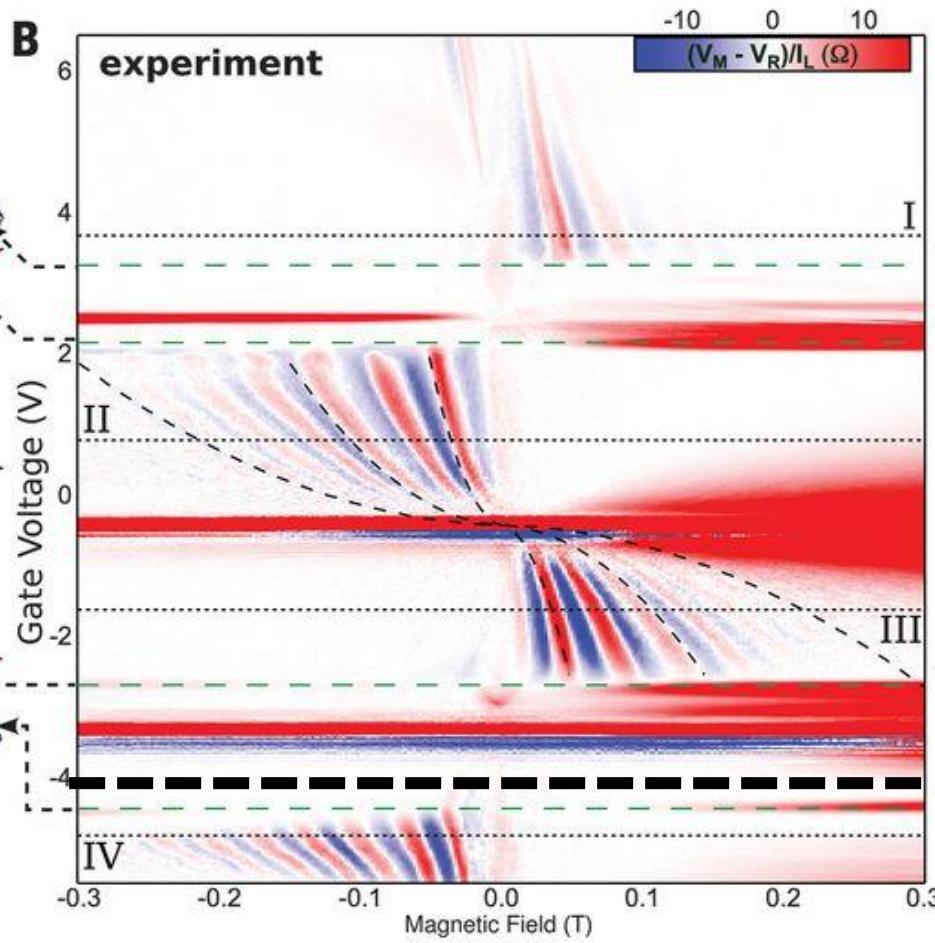
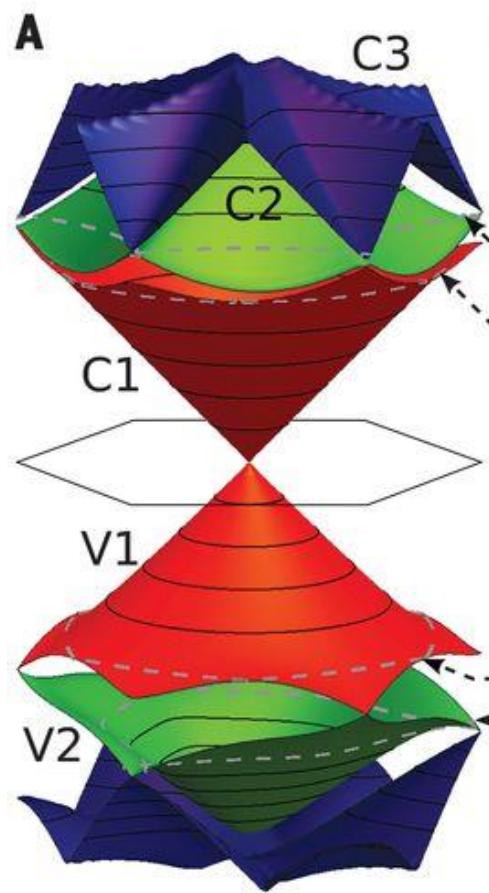
Superlattice Collimator



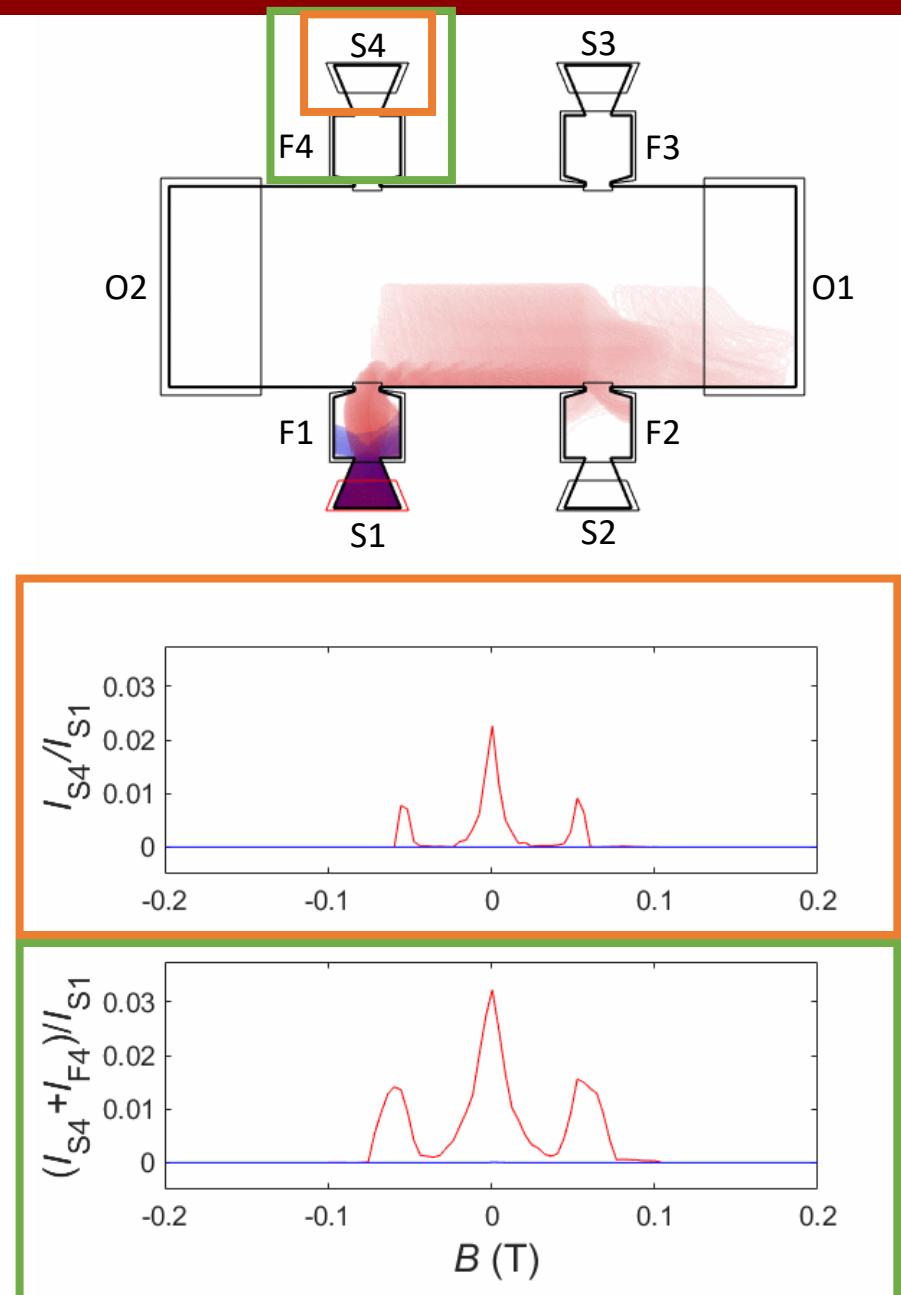
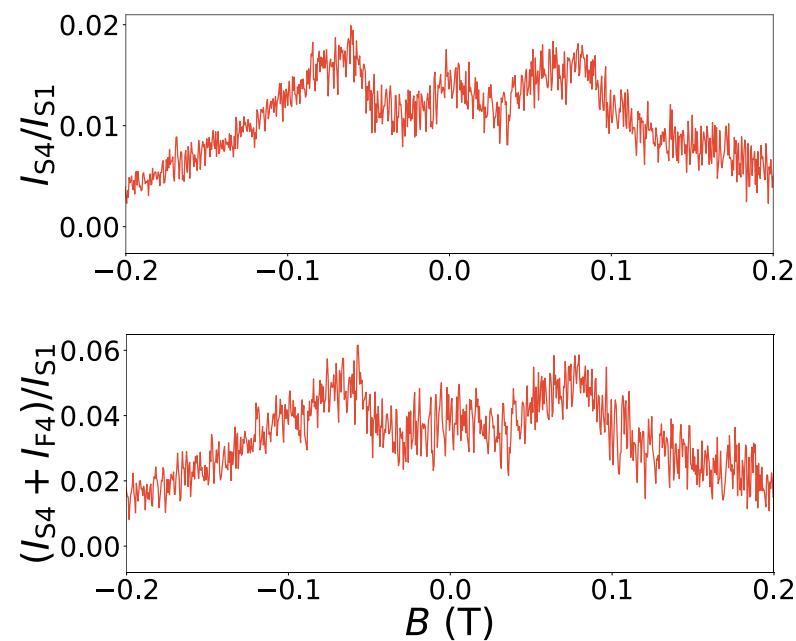
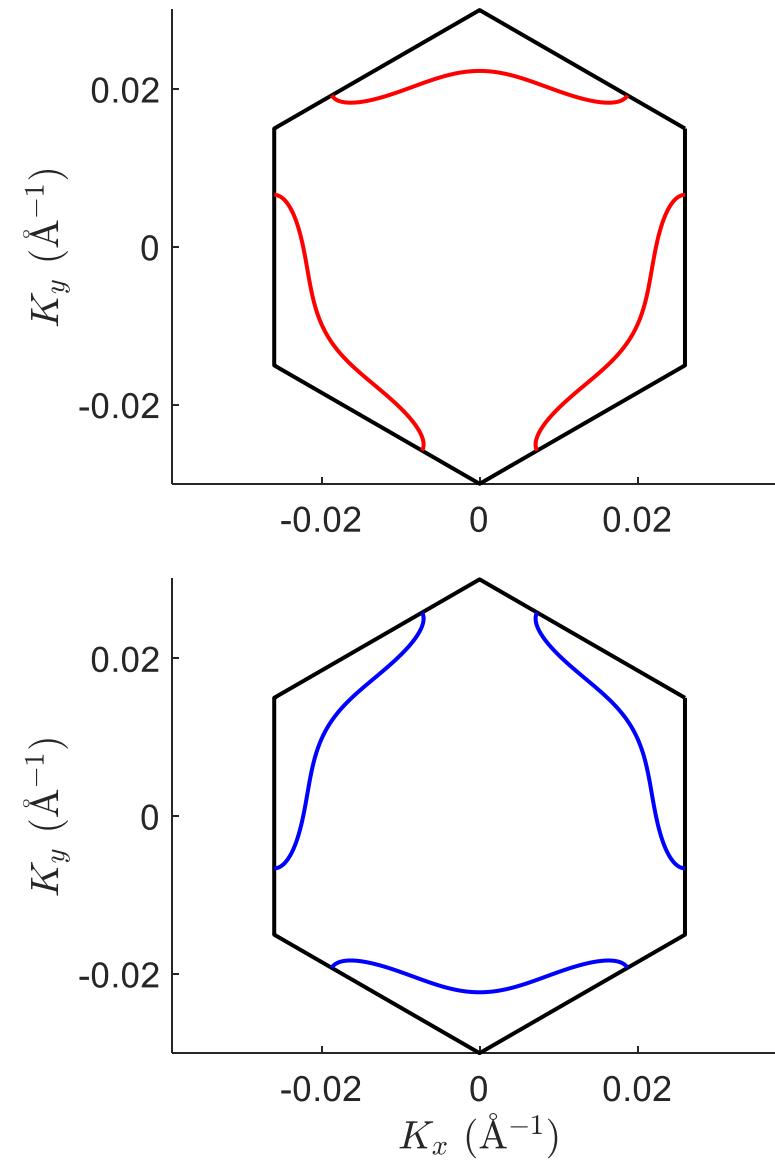
Valley Asymmetric Orbits



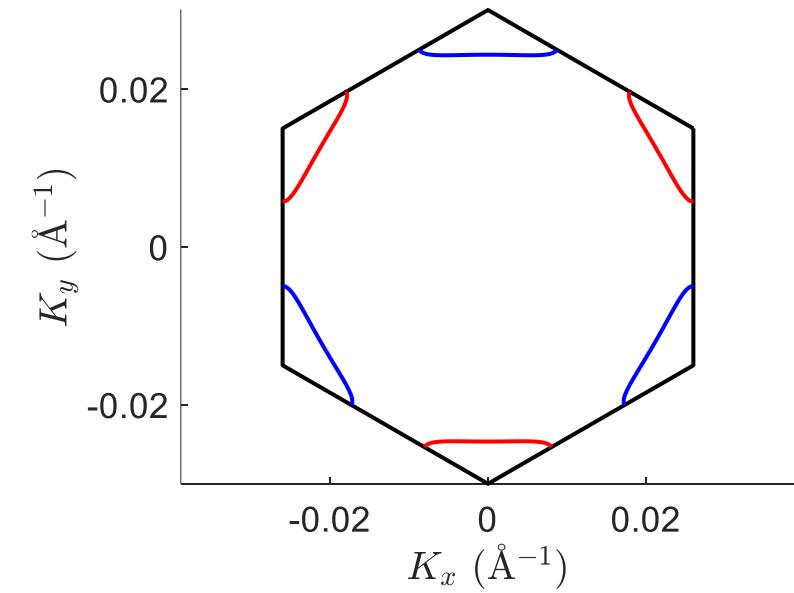
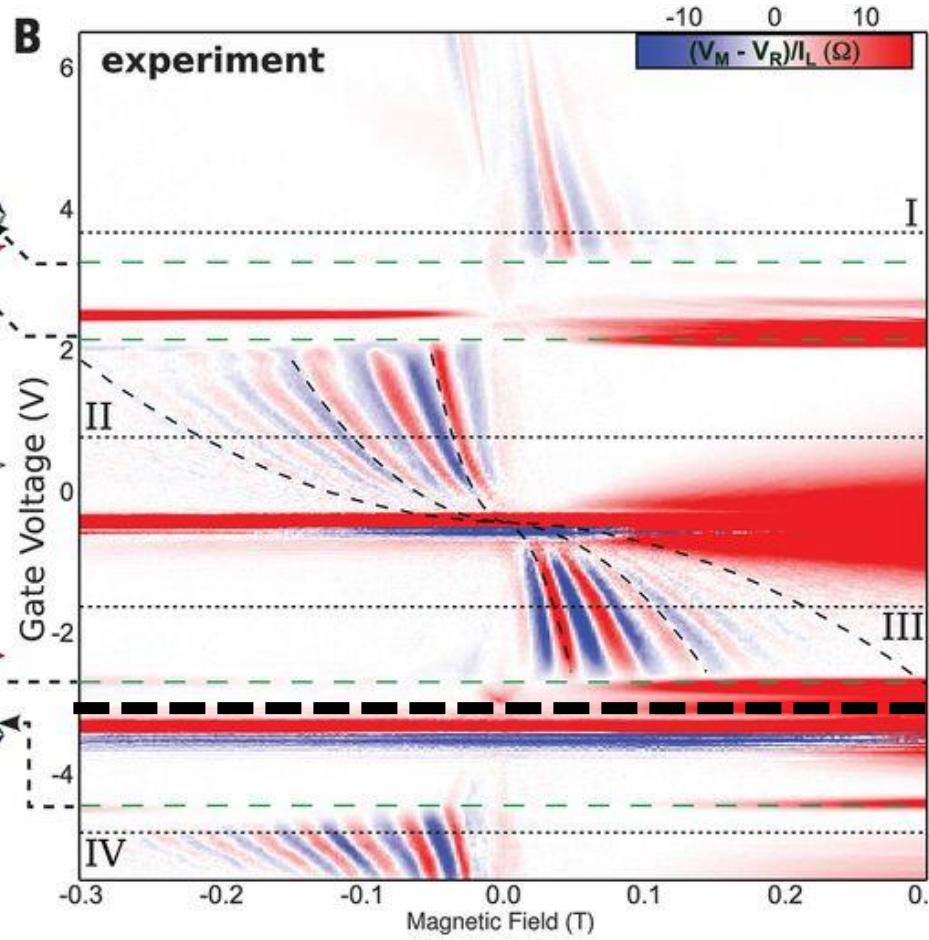
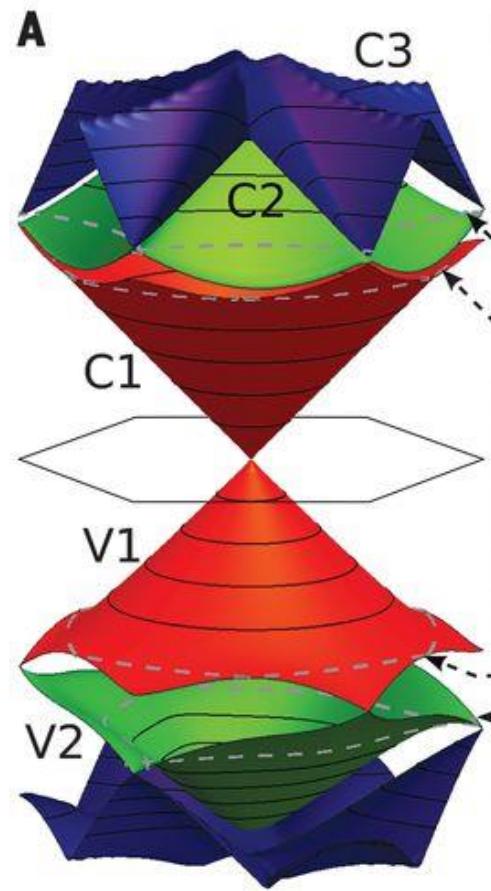
Valley Asymmetric Orbits



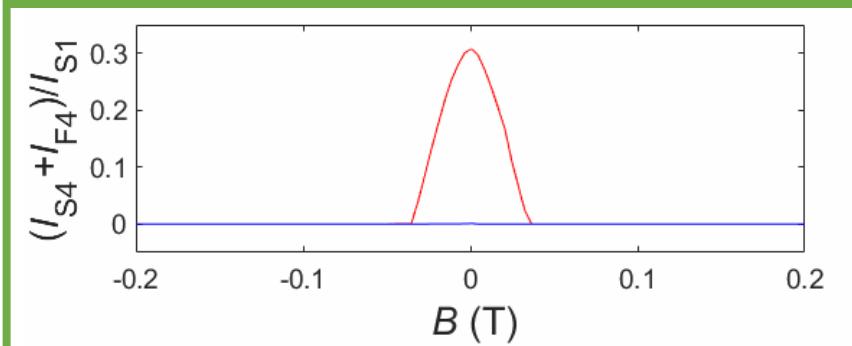
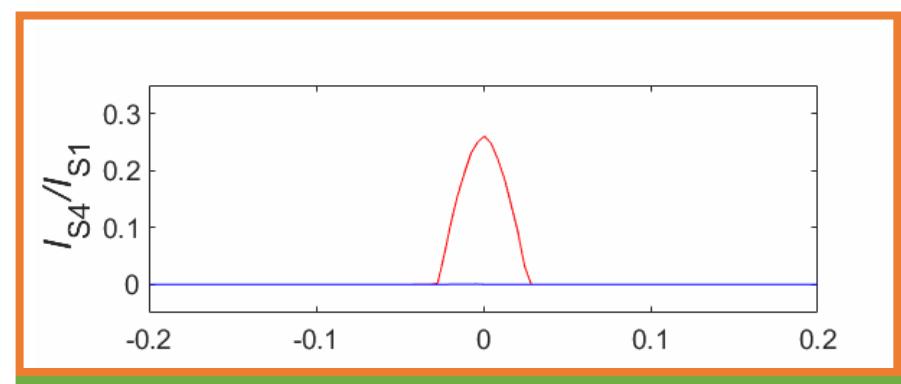
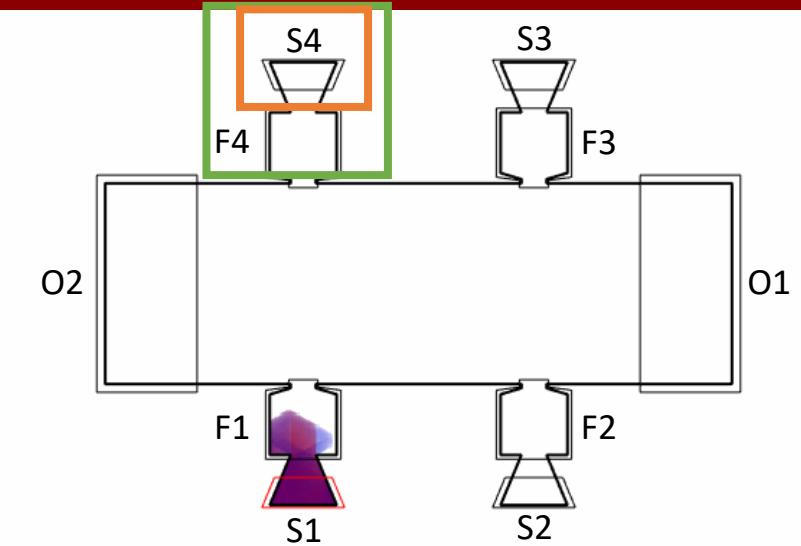
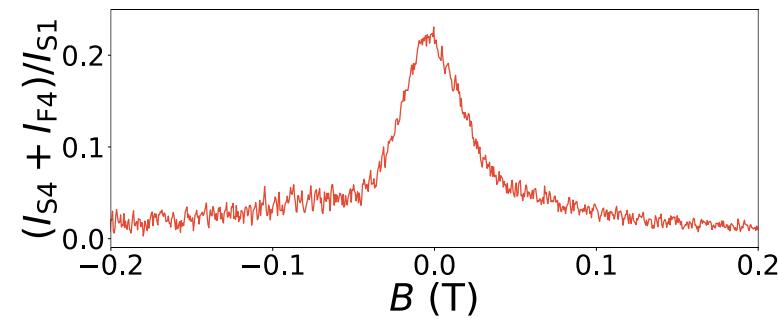
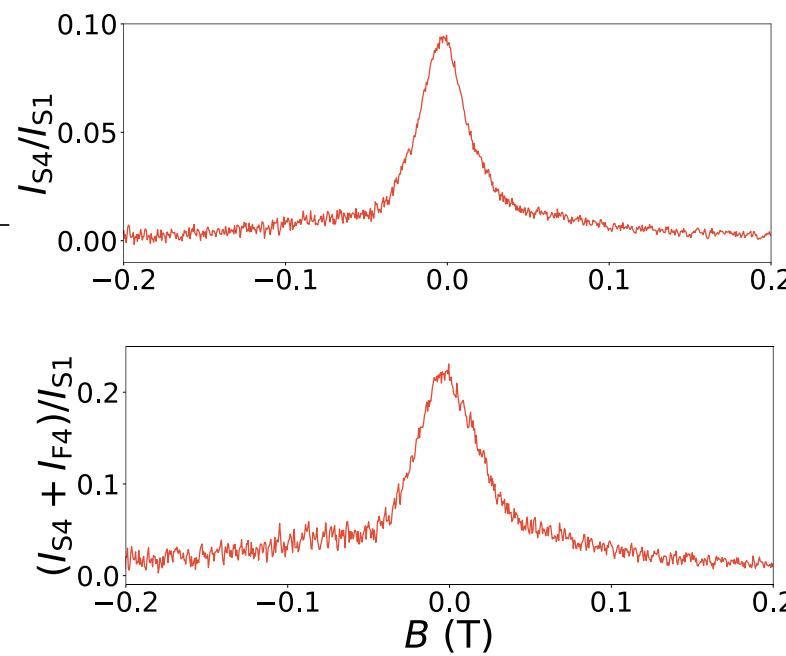
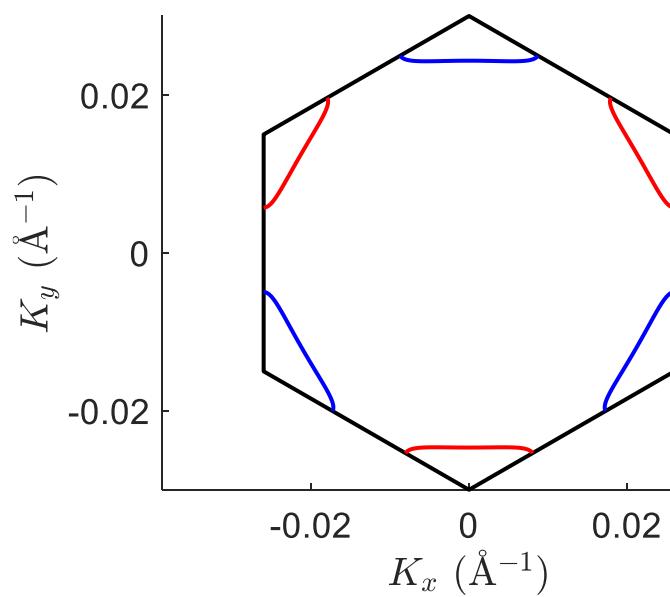
Valley Asymmetric Orbits



Miniband-Valley Asymmetric Orbits



Miniband-Valley Asymmetric Orbits



Asymmetric Orbits: Temperature Dependence

This page contains a collection of plots showing the dependence of asymmetric orbits on temperature. The plots are organized by the type of orbit: radial, elliptical, and hyperbolic.

The plots show the distribution of orbital parameters (e.g., semi-major axis, eccentricity, inclination) as a function of temperature. The temperature range is typically from 100 K to 1000 K.

The plots are generated using a numerical simulation code that solves the equations of motion for a test particle in a gravitational field. The code uses a finite-difference scheme to solve the equations of motion, and the results are plotted using a variety of statistical methods.

The plots are intended to provide a visual representation of the statistical properties of asymmetric orbits, such as the distribution of orbital parameters and the dependence of these properties on temperature.

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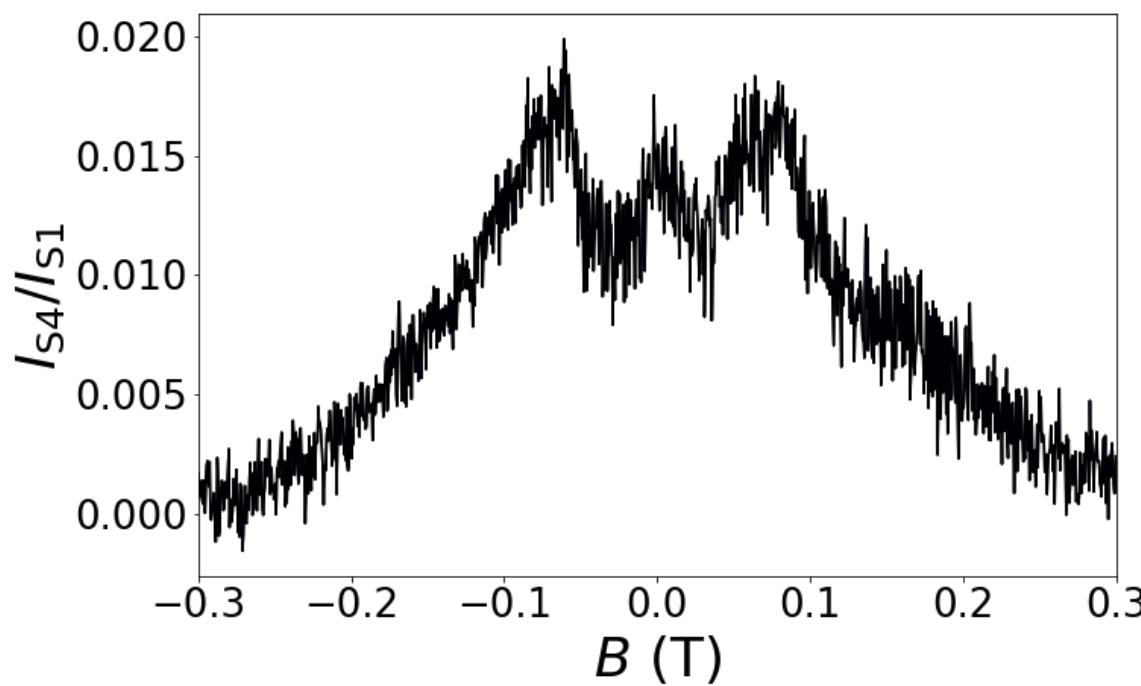
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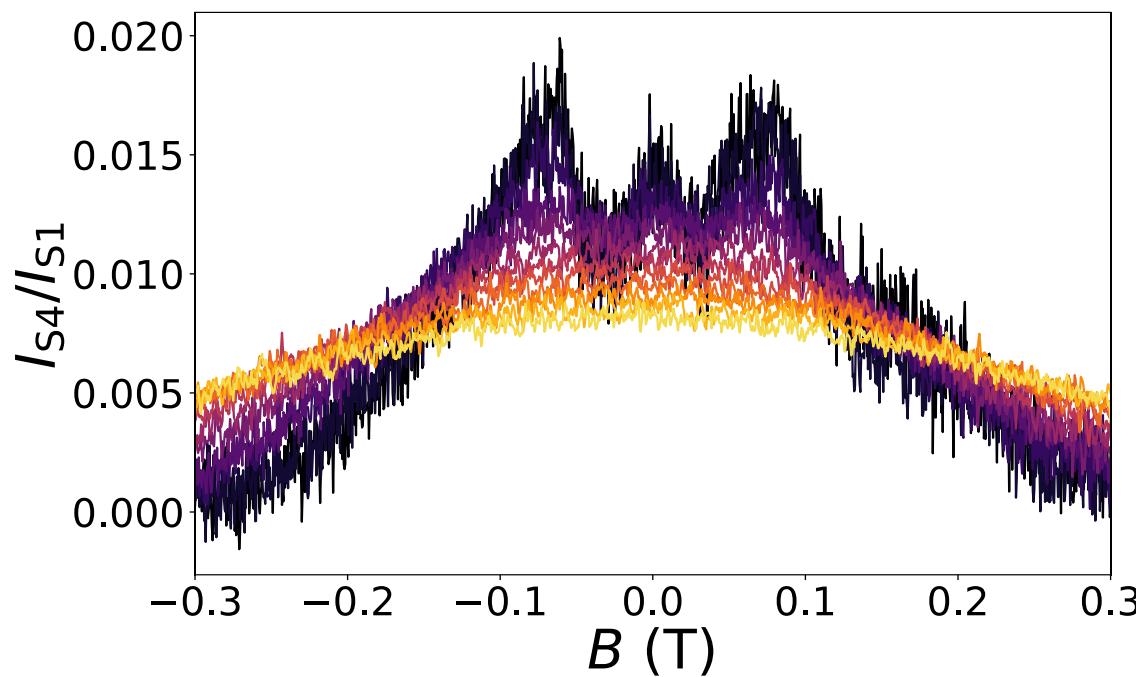
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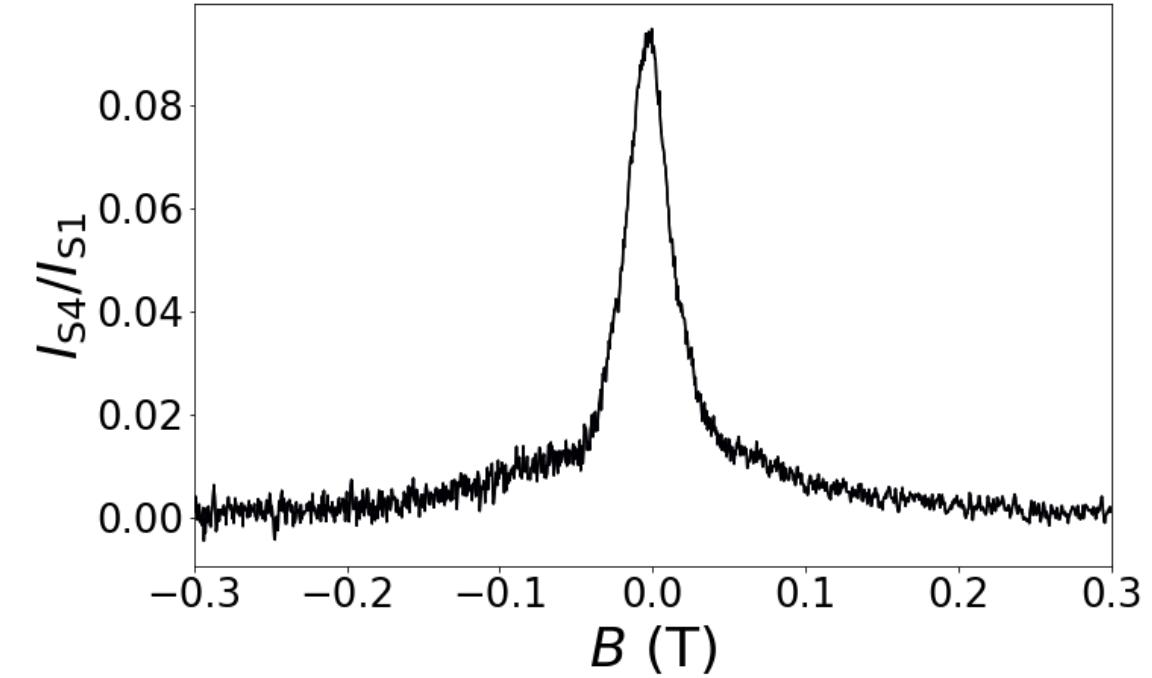
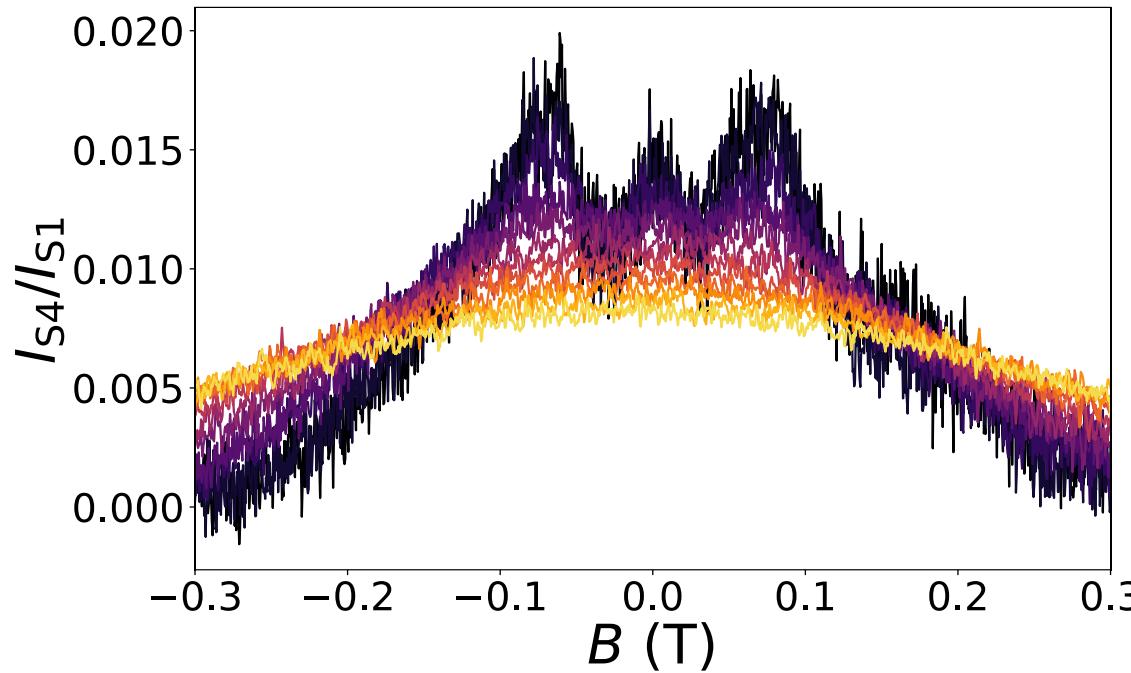
Asymmetric Orbits: Temperature Dependence



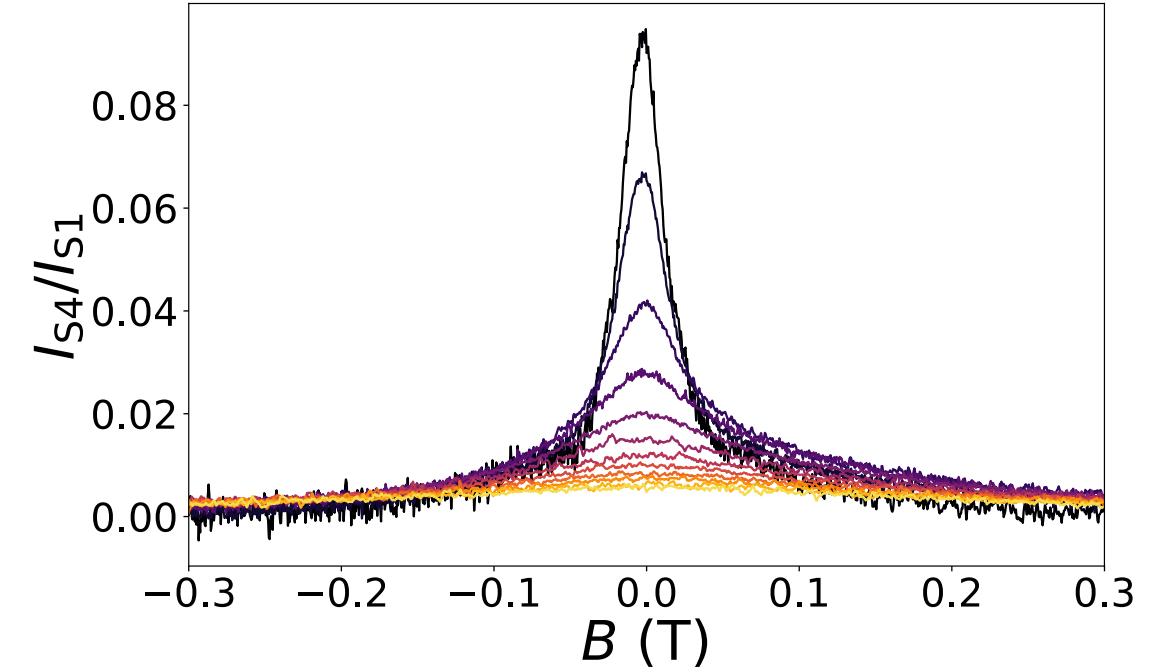
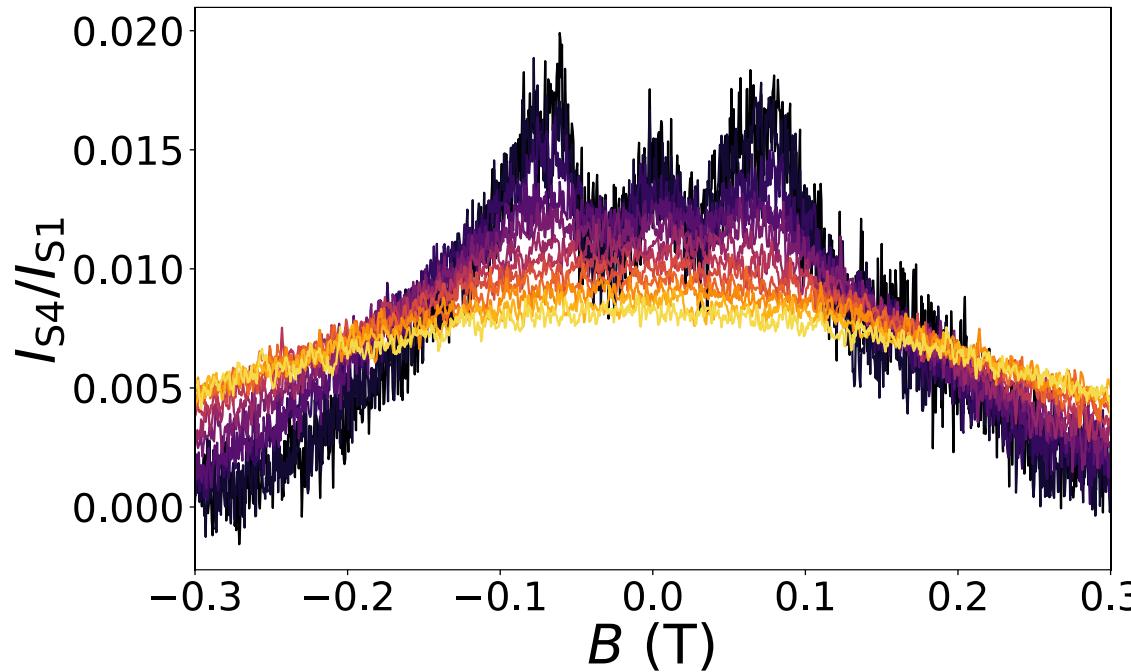
Asymmetric Orbits: Temperature Dependence



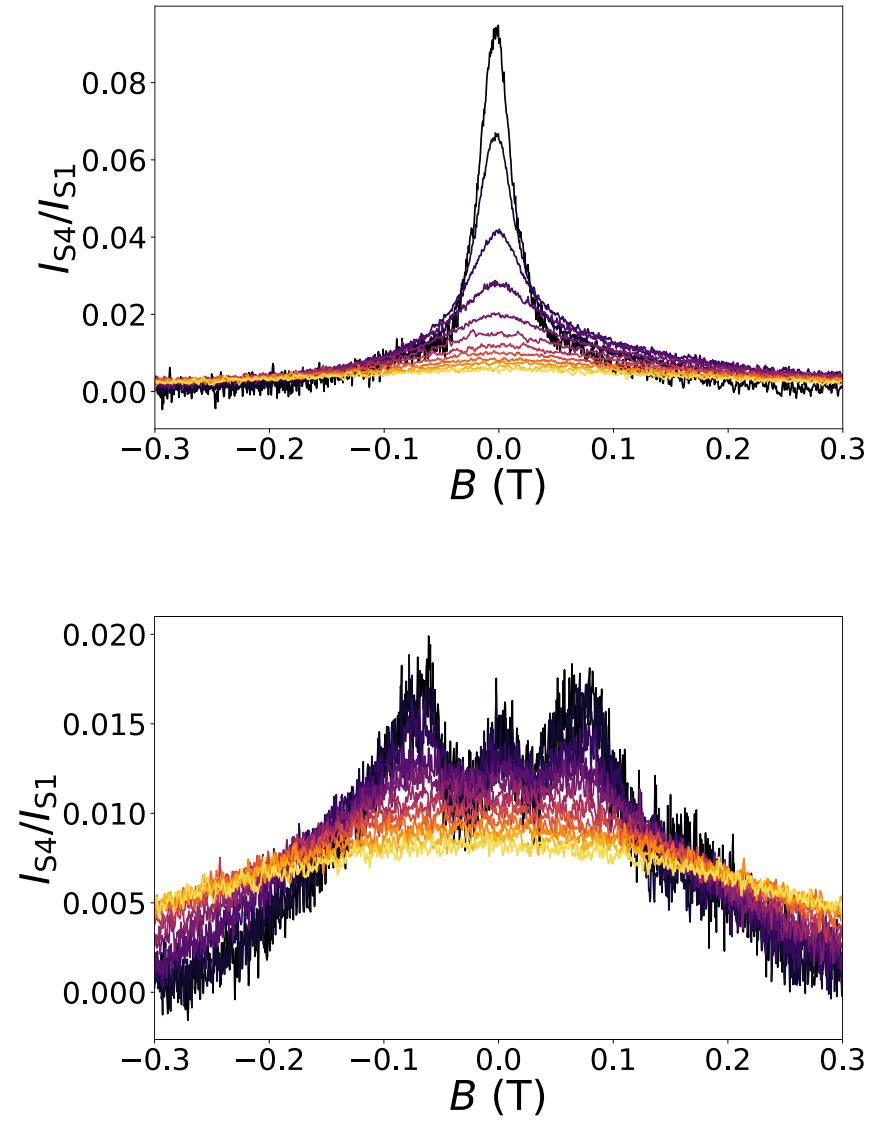
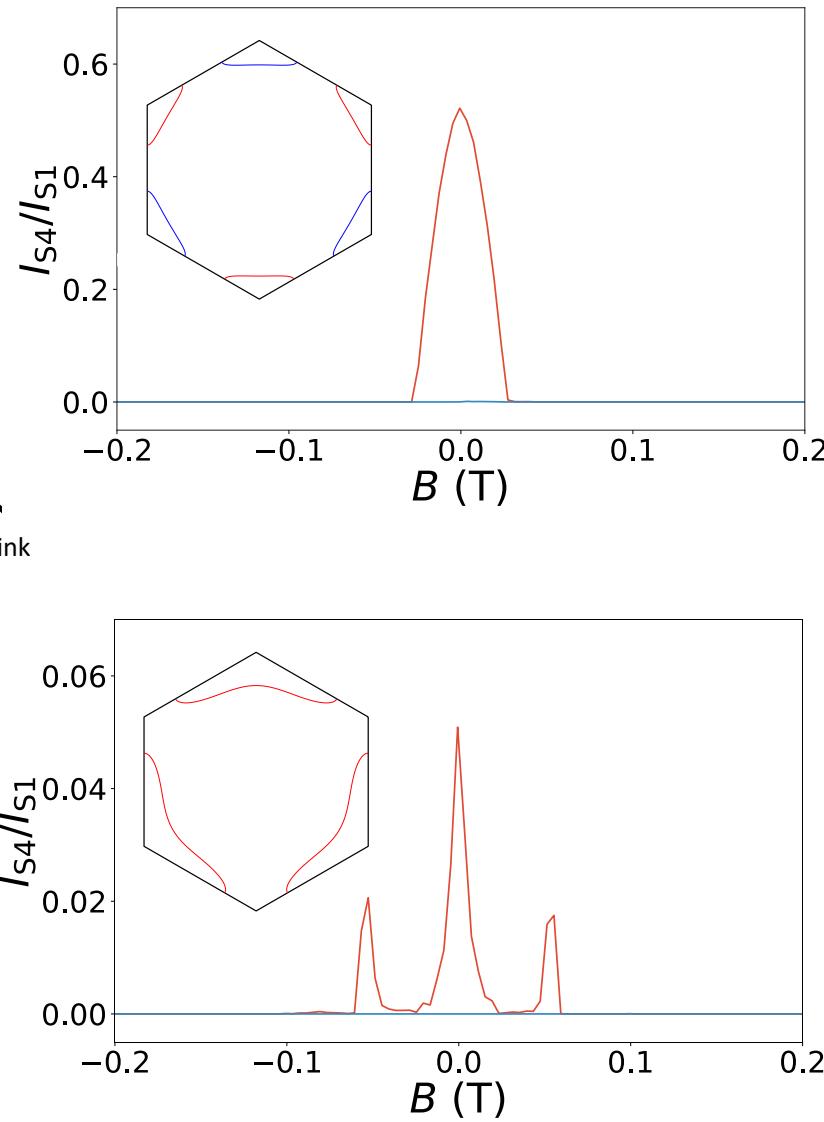
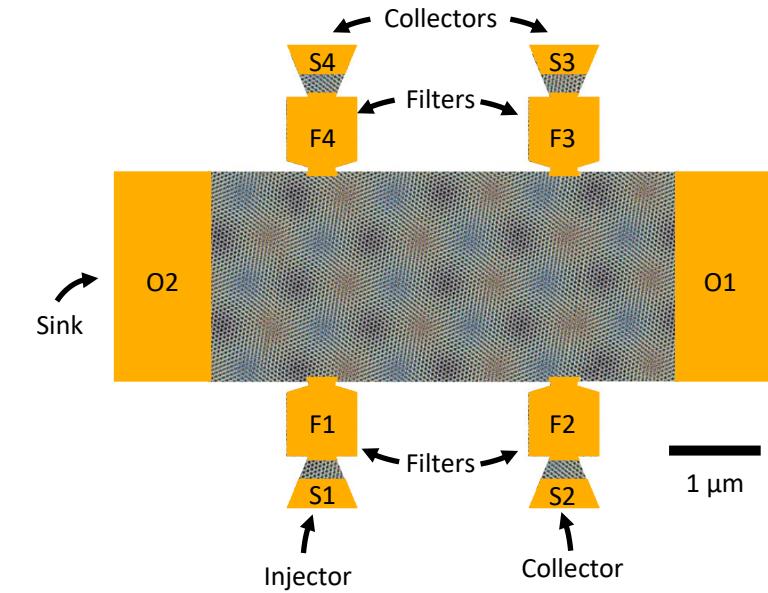
Asymmetric Orbits: Temperature Dependence



Asymmetric Orbits: Temperature Dependence



Conclusions



Acknowledgements



Prof. Goldhaber-Gordon



Dr. Barnard



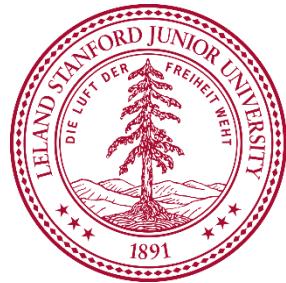
Dr. Wallbank



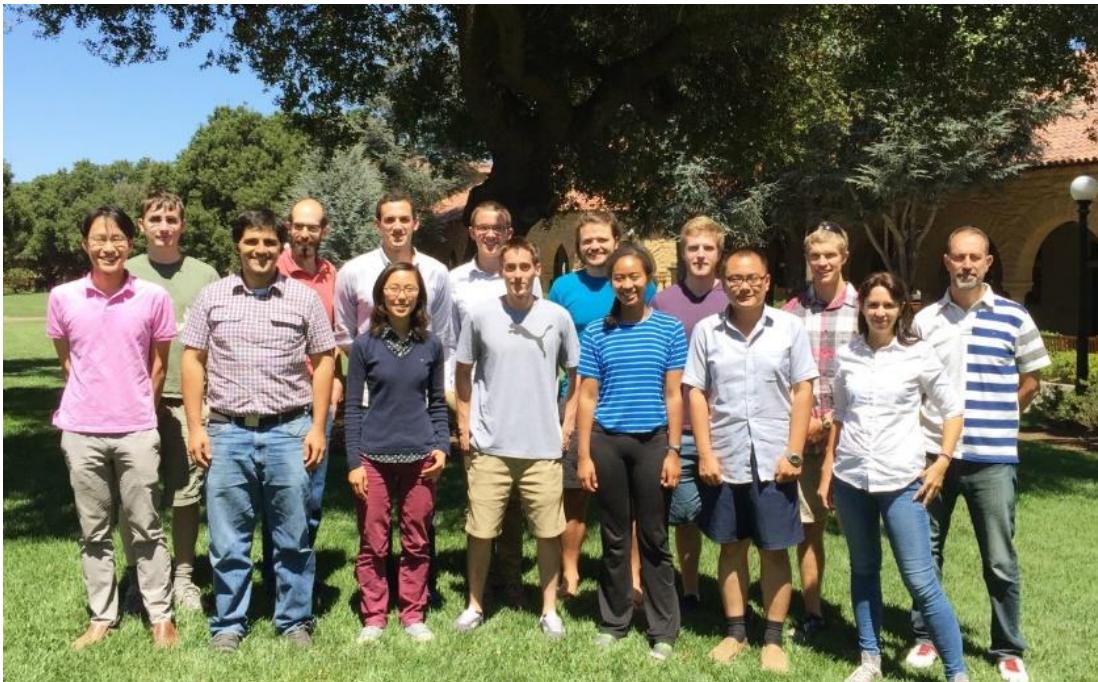
Dr. Watanabe



Dr. Taniguchi



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