

Data underlying the research of Fingerprint of chiral Majorana modes in a QAHI/superconductor heterostructure

The files contain differential conductance data of point contacts measured at the edge of $(\text{Cr}_{0.12}\text{Bi}_{0.26}\text{Sb}_{0.62})_2\text{Te}_3$ / Nb heterostructures. As contained in arXiv:1809.04752. All data is provided in the raw data form. The data of Contact 1 was measured in different magnetic fields during a full hysteresis cycle of the quantum anomalous Hall insulator (QAHI). It covers 3 different regimes attributed to a superconducting $N=2$ state where the chiral QAHI mode is believed to form two chiral Majorana modes, a trivial insulating state without chiral edge mode, and a transition regime in which it is believed that one of the chiral Majorana mode diffuses into the bulk so that only one edge mode $N=1$ persists. See arXiv:1809.04752 for details.

Contact information: Rolf Lortz, Department of Physics, HKUST, lortz@ust.hk

Description of the content:

Three sets of data are included:

Raw data of Contact 1 as shown in Fig. 2 of arXiv:1809.04752:

"**Datamtop.dat**" contains raw data in text format measured from negative fields towards positive fields. The data consists of pairs of columns containing bias voltage (V) and dI/dV (in units of $2e^2/h$). The labels mark the field values. The data features a relatively large positive contribution from a highly transparent contact to the Nb layer, superposed by a smaller contribution attributed to the QAHI. The data at 150, 175 and 200 mT represents the trivial insulating state without edge conduction. In arXiv:1809.04752 the 175 mT data was subtracted as a background from the other field data.

"**Dataptom.dat**" contains raw data in text format measured from positive fields towards negative fields. The data consists of pairs of columns containing bias voltage (V) and dI/dV (in units of $2e^2/h$). The labels mark the field values. The data at -150, -175 and -200 mT represents the trivial insulating state without edge conduction. In arXiv:1809.04752 the -175 mT data was subtracted as a background from the other field data. Together with the data in Datamtop.dat it represents a set of data measured during a full hysteresis cycle of the QAHI.

Raw data of Contact 2 as shown in Fig. 1e of arXiv:1809.04752:

The data of Contact 2 only features a small Nb contribution in form of a shallow broad gap-like feature associated to a low-transparency contact to the Nb. The contribution of the superconducting QAHI can be directly seen without background subtraction. The data is contained in 3 text files named "**Contact2f0mT.dat**" (0-field data, $N=2$), "**Contact2f50mT.dat**" (50 mT data, $N=2$), "**Contact2f100mT.dat**" (100 mT data, $N=1$). The data consists of pairs of columns containing bias voltage (mV) and dI/dV (in units of mS). The labels mark the field values.

Methodological information:

The data was measured on QAHI films entirely covered by a superconducting Nb layer. The QAHI films consisted of a $\text{Cr}_{0.12}\text{Bi}_{0.26}\text{Sb}_{0.62})_2\text{Te}_3$ layer of 6 nm thickness on a GaAs substrate. The Nb layer was 200 nm thick. The devices were made from slabs of ~ 2 mm x 5 mm cut from the wafer. Small nano point contact

were deposited onto a polished edge of the heterostructure. Differential conductance vs. bias voltage measurements were conducted in a dilution refrigerator with the magnetic field applied perpendicular to the film. See [arXiv:1809.04752](https://arxiv.org/abs/1809.04752) for further details.

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