

Formation and electronic properties of X- and T- shaped InSb nanowires and nanowire networks

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Abstract.

Signatures of Majorana fermions have recently been reported in an InSb single - nanowire device.^[1,2] In order to prove the non-abelian properties of Majorana fermions, it is necessary to perform logical operations by interchanging the positions of the two Majoranas.^[3] This is not possible in a single InSb nanowire; Majorana fermion is its own antiparticle so when two Majoranas meet they annihilate. Therefore, more complex structures are needed.

We have investigated the formation of X- and T-shaped InSb nanowires. Depending on the meeting angle of the two wires, these structures can be single crystalline. We are now developing a method to increase the yield of single-crystalline crosses. With this method we can also make nanowire networks. First electrical measurements

done on these nanostructures will be discussed. Hall effect measurements at low temperature prove the high quality of these new structures.

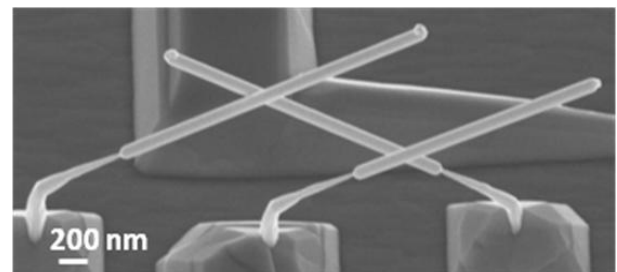


Fig. 1 A 30°-tilted-view SEM image of a double-junction InSb nanowire structure.

References

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