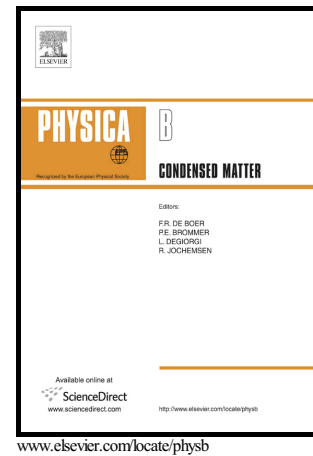


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Robust weak anti-localisation effect in strongly textured nanocrystalline Bi_2Se_3 samples

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Abstract

Topological insulators are a quantum state of matter that has recently created a great interest among the scientific community, with Bi_2Se_3 being one of the most extensively studied materials. Here, we demonstrate that polycrystalline nanostructured samples of Bi_2Se_3 preserve the existence of topological surface states, where electrons cannot be localised. The nanosheet crystals were synthesised by a microwave-assisted method and their structure, composition and morphology thoroughly characterised. The transport properties of a textured polycrystalline sample with strong preferred orientation along the c -axis were measured, showing the presence of the weak anti-localisation effect and Shubnikov-de Haas oscillations. These features are robust against the presence of non-magnetic impurities and structural defects.

Keywords:

Topological Insulator, Weak anti-localisation, Magnetoresistance, Bi_2Se_3

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