

Observation of the AB effect in Single-Walled Carbon Nanotube by Contactless Method

非接触法による単層カーボンナノチューブの AB 効果の観測

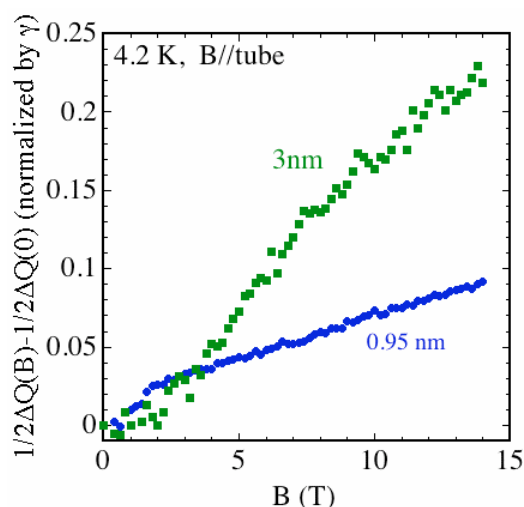


Fig. 1 Tube diameter dependence of $1/2 \Delta Q$.

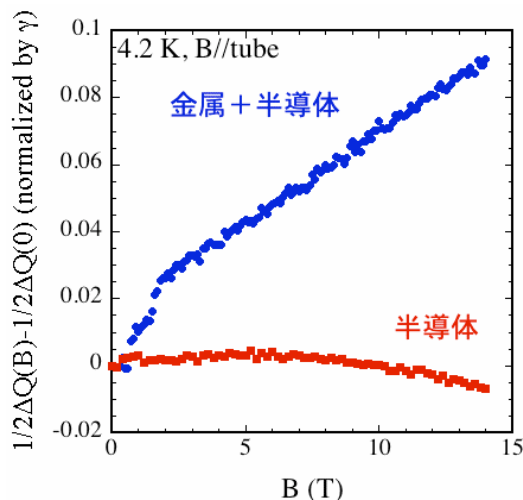


Fig. 2 Comparison of $1/2 \Delta Q$ for HiPco thin-film (mixed SWNTs) and sorted semiconducting SWNT film.

Intrinsic magnetotransport effect of the single-walled carbon nanotube (SWNT) has been observed by the cavity perturbation technique, which is a non-contact method for evaluating the transport properties. Angular and tube diameter dependence using oriented SWNT thin films, and measurements using sorted SWNTs reveal that the observed positive magnetoresistance is ascribed to the Aharonov-Bohm effect of metallic nanotubes.

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Reference: Y. Oshima, T. Takenobu, K. Yanagi, Y. Miyata, H. Kataura, K. Hata, Y. Iwasa and H. Nojiri, "Intrinsic Magnetoresistance of Single-Walled Carbon Nanotubes Probed by a Noncontact Method" Phys. Rev. Lett. 104 (2010) 016803

我々は空洞共振器摂動法を用いて単層カーボンナノチューブの本質的な磁気伝導特性を初めて観測した。B//tube時に顕著な磁気抵抗が現れる事、チューブ直径依存性と分離チューブを用いた測定から、我々は金属 SWNT の AB 効果を初めて観測したと考える。

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