

# Enhanced magnetoconductance fluctuations due to proximity effect

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We have studied proximity effect in a sandwich structure, network-like carbon nanotubes coupled with superconducting NbN electrodes that have a very high  $H_{c2}$  like about 10 T. The carbon nanotubes are found to have the characteristics of single-wall ones. The proximity effect gives rise to multiple Andreev reflection and enhanced magnetoconductance fluctuations (EMF). The proximity correction to the conductance and (EMF) disappear at low temperatures and reach a maximum at around 8K, which is related to the Thouless energy. This reentrant behavior has been also theoretically expected in the dependence of EMF on the magnetic field and the observed EMF shows a maximum at a very large magnetic field around 2.5-3 T, which is related to the critical field of the proximity effect. The magnetic field dependence of EMF is discussed from the view point of one-dimensionality of the carbon nanotube network system.