

Abstract Submitted  
for the MAR12 Meeting of  
The American Physical Society

**Distinctive Magneto Conductance and Universal Scaling in One Dimensional Polymer Nanofibers** AJEONG CHOI, KYUNG HO KIM, SUNG JU HONG, Seoul National University, MUNJU GOH, KAZUO AKAGI, Kyoto University, RICHARD B. KANER, UCLA, YUNG WOO PARK, Seoul National University — The conducting polymers are one dimensional organic hydrocarbon systems where the non-linear local excitations such as solitons, polarons and bipolarons were predicted based on the electron-phonon interactions. The local excitations have different spin-charge relations in different kinds of polymers. In this work, the magneto conductance (MC) of polymer nanofibers is investigated in high magnetic field at low temperature to understand both spin (magneto) and charge (conductance) of the charge carriers simultaneously. We discovered the distinctive zero MC in polyacetylene nanofibers while the finite MC in polyaniline and polythiophene nanofibers. On the other hand, the charge transports of polymer nanofibers as a function of temperature and bias are observed to be scaled onto the universal curve. We conclude that the universal scaling and the zero MC (the finite MC) in polyacetylene (polyaniline and polythiophene) nanofibers are from the interacting spinless charged solitons (interacting polarons which have both spin and charge).

Yung Woo Park  
Seoul National University

Date submitted: 13 Nov 2011

Electronic form version 1.4