

Abstract Submitted  
for the MAR09 Meeting of  
The American Physical Society

**Gauge field for the edge states in graphene** KEN-ICHI SASAKI,  
Department of Quantum Matter, AdSM, Hiroshima University, Japan, SHUICHI  
MURAKAMI, Department of Physics, Tokyo Institute of Technology and PRESTO,  
JST, Japan, RIICHIRO SAITO, Department of Physics, Tohoku University, Japan  
— By considering a continuous model for graphene, we study a special gauge field  
for the edge state. The gauge field explains the properties of the edge state such as  
the existence only on the zigzag edge, the partial appearance in the k-space, and the  
energy position around the Fermi energy. The gauge field polarizes the pseudospin.  
The applications of the gauge field to the ferromagnetism of edge states and the  
electron-phonon interaction are reported on.

Ken-ichi Sasaki  
Department of Quantum Matter, AdSM, Hiroshima University, Japan

Date submitted: 19 Nov 2008

Electronic form version 1.4