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.