Abstract Submitted
for the HAW09 Meeting of
The American Physical Society

The role of pions on finite nuclei with relativistic chiral mean field model YOKO OGAWA, HIROSHI TOKI, Research Center for Nuclear Physics, Osaka University — We present a relativistic chiral mean field (RCMF) model, which is a method for proper treatment of pion-exchange interaction in the nuclear-many body problem. There the term of the pionic correlation is expressed in 2-particle 2-hole (2p-2h) states with particle-hole having pionic quantum number $J^\pi = 0^1, 1^+, 2^-, 3^+$,...to describe the full strength of the pionic correlation in the intermediate- and long-ranged region (r $>$ 0.5 fm). We include further the effect of the short-range repulsion in terms of the unitary correlation operator method (UCOM) for the central part of the pion-exchange interaction. We apply this model to ^{4}He, ^{12}C, and ^{16}O nuclei. Pion plays an important role on the formation of the jj-magic shell structure by the Pauli-blocking mechanism of the pion- exchange interaction. The lowest pionic quantum number, $J^\pi = 0^-$, is the dominant component for construction of the surface structure. We also discuss chiral symmetry in finite nuclei in the linear sigma model.

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Date submitted: 28 Jun 2009 Electronic form version 1.4