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**Pion Condensation with Parity and Charge Projection in Relativistic Mean Field Model for Finite Nuclei** HIROSHI TOKI, YOKO OGAWA, RCNP Osaka, SATORU SUGIMOTO, Kyoto, KIYOMI IKEDA, RIKEN — We study the role of pion on nuclear structure in the relativistic mean field model with projection of parity and charge before variation. We find that the effect of the projection of parity and charge is extremely large for the case of pion condensation, which makes violation of parity and charge number causing particle jump of major shells. [Y. Ogawa et al., Prog. Theor. Phys. 111, 75 (2004)] The energy gain due to the pion becomes the major source of binding for not only jj-closed shell nuclei but also LS-closed shell nuclei due to the projection. The pion contributes also to the spin-orbit splitting of finite nuclei, which are the foundation of nuclear shell structure. We calculate  $N=Z$  nuclei using the chiral sigma model Lagrangian. We find the reduction of sigma mean field by about 20%, which corresponds to the recovery of nuclear chiral condensate by 20%. About a half of the spin-orbit splitting comes from sigma and omega and the other half from pion.

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