

International Conference on

# Atomic and Nuclear Physics

November 17-18, 2016 Atlanta, USA

## To understand atomic nucleus from a new nuclear structure model

Xiaodong Li, Qijun Liu, Gongyi Li, Yihe Li and Zengyong Chu  
National University of Defense Technology, P R China

To explain some basic facts of atomic nucleus, a nuclear structure model of “ring plus extra nucleon” is proposed. For nuclei larger than  ${}^4\text{He}$  inclusive, protons (P's) and neutrons (N's) are basically bound alternatively to form a  ${}^{2Z}_Z\text{E}$  ring. The ring folds with a “bond angle” of  $90^\circ$  for every 3 continuous nucleons to make the nucleons packed densely. Extra N('s) can bind to ring-P with the same “bond angle” and “bond distance”. When 2 or more P's are geometrically available, the extra N tends to be stable. Extra P can bind with ring N in a similar way when the ratio of  $N/P < 1$  although the binding is much weaker. Even-Z rings always have superimposed gravity centers of P and N; while for odd-Z rings, both centers of P and N must be eccentric. The eccentricity results in a depression of  $E_B$  and therefore specific zigzag features of  $E_B/A$ . This can be well explained by the shift of eccentricity by extra nucleons. Symmetrical center may present in even-Z rings and normal even-even nuclei. While for odd-Z ring, only anti-symmetric center (every P can find an N through the center and vice versa) is possible. Based on this model, a pair of mirror nuclei,  $P_{x+n}N_x$  and  $P_xN_{x+n}$ , should be equivalent in packing structure just like black-white photo and the negative film. Therefore, an identical spin and parity was confirmed for hundreds of pairs. In addition, the  $E_B/A$  difference of all the mirror nuclei pair is very nearly a constant of  $0.184n$  MeV. Many other facts can also be easily understood from this model, such as the nuclear stabilities of isotopes in elements from He to Ne; the stability sequence of  ${}^9\text{Be}$ ,  ${}^{10}\text{Be}$ ,  ${}^7\text{Be}$  and  ${}^8\text{Be}$ ; the neutron halo in neutron-rich nuclides; the general rule for most stable isotopes: odd-Z elements are odd A, even-Z elements are even A; and the highest cohesive energy of Li, Be, B atoms in their own elementary group and so on.

xdli0153@sina.com

## Atomic energy is the source of power which is another form of electrical energy

Manish Kumar  
Indian Institute of Technology- BHU, India

Atomic energy is the source of power which is another form of electrical energy. This electrical energy is basically the fundamental energy which is the source of all other energy known to world. We can say that from the prediction of genius Albert Einstein for the unification of forces it is the electrical force that is the root cause of all other forces. When a charge particle moves, it produces magnetic force i.e. electrical energy is converted to magnetic energy and charge particle has only electrical energy only. It is the movement of electrical energy that leads to generation of magnetic energy according to the Maxwell's law. Since these forces are long range forces so when they follow the Maxwell's law leads to generation of electromagnetic radiation. The weak and strong nuclear forces discovered which is the cause for binding sub-atomic particles into the nucleus is nothing but the electrical energy being converted into sub-atomic particles due to the conversion of electrical energy into mass with the electrical charge of positive and negative character depending upon the orientation of electrical energy into clockwise or anticlockwise direction. The packing of electrical energy into mass is governed by the anti-law that leads the conversion of mass into energy in the atomic energy given by Einstein's famous relation  $E=mc^2$ .

mkumar.eee@itbhu.ac.in