**On the Assumption of a Crystal Structure of the Atomic Nucleus**

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Cook and Dallacasa (Phys. Rev. **C 35**, 1883 (1987), Nuovo Cimento **97A**, 157 and 184 (1987)) have investigated the solid phase of nuclear matter and discussed the analogy between a crystal structure in phase space and the location of nucleons in real space. According to this, nucleons have a fixed location.

The current paper is based on the assumption that nucleons, according to their Shell Model orbital angular momentum $\ell$, move on rectangular paths with a maximum occupancy of $2(2\ell+1)$, so that quantum-mechanical standing waves are formed, arranged in the form of the cubic closest-packing of spheres. The doubly magic nuclei $^{4}$He, $^{16}$O and $^{40}$Ca possess the highest symmetry and need to be rearranged before the addition of further nucleons – in agreement with binding-energy trends. The Coulomb energy of the odd proton is calculated for 28 single-particle states of mirror nuclei with $T_z=\pm\frac{1}{2}$, whereby the Coulomb energy of the two protons in $^{3}$He only is used. The agreement with empirical values is −1.6 to 0.8 %. From this a distance between nearest-neighbor nucleons of 1.885fm ± 0.009fm is derived.