

C5 Antilinear Operators in the Theory of Nuclear StructureF. HERBUT and M. VUJIČIĆ, *Institute "Boris Kidrič", Beograd*

Lately, self-consistent field methods (Hartree-Fock theory and Hartree-Bogolyubov theory) have been applied with great success to the study of nuclear structure. To simplify these variational problems a new mathematical formalism utilizing the algebra of antilinear operators¹⁾ has been developed.

This formalism generated new formulations of the Hartree-Bogolyubov theory in one-particle space²⁾ and quasiparticles space³⁾. This permitted construction of original methods for solving the dynamical equations of the theory, which were based on antilinear symmetries. On the assumption that the pairing operator is a given symmetry operator of the nuclear Hamiltonian, two versions of the dynamical equations were obtained. They consist of two interdependent parts, a Hartree-Fock and a Bardeen-Cooper-Schrieffer part²⁾. To solve both versions canonical forms of antilinear operators were used¹⁾. It was further shown that general complex Hartree-Bogolyubov equations in quasiparticle space can be solved by iterative diagonalization of a real symmetric matrix³⁾. For this purpose an antilinear matrix characteristic for the theory itself was utilized.

These substantial simplifications in solving the dynamical equations should stimulate and enable more ambitious and elaborate computations in nuclear structure theory. Computations of this kind are in progress.

References

- 1) F. Herbut and M. Vujičić, *Journ. Math. Phys.* **8** (1967) 1345;
- 2) F. Herbut and M. Vujičić, *Phys. Rev.* **172** (1968) 1031;
- 3) M. Vujičić and F. Herbut, to be published.

C6 Phenomenological Limit of Semimicroscopic DescriptionL. ŠIPS, *Institute "Ruđer Bošković", Zagreb***C7 On the BCS-Model in Nuclear Theory**J. HENDEKOVIĆ, *Institute "Ruđer Bošković", Zagreb*

The simple vibrational model failed to describe adequately the complex structure of the low-lying spectrum of some spherical vibrational nuclei, such as Sn isotopes. The main problem in the microscopic description of these nuclei arises from the large number of active particles moving in a limited number of orbitals. In some cases satisfactory results can be obtained by