

NATIONAL ACADEMY OF SCIENCES OF UKRAINE

Bogolyubov Institute for Theoretical Physics

Institute of Mathematics

Bogolyubov Kyiv Conference

**PROBLEMS OF THEORETICAL AND
MATHEMATICAL PHYSICS**

The Conference is dedicated to the 110th anniversary
of the outstanding theoretician in the physical sciences and mathematician
M.M. Bogolyubov (1909-1992)

September 24 – 26, 2019

Kyiv, Ukraine

Program & Abstracts

Kyiv 2019

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Nuclear Matter

Thursday, September 26, 2019

14.00 – 14.25	A. Dzyublik <i>Institute for Nuclear Research, Ukraine</i> Time Evolution of Wave Function for Cluster Decay of Nuclei
14.25 – 14.50	S. Maydanyuk <i>Institute for Nuclear Research, Ukraine</i> Study of Quark Structure of Protons under Nuclear Reactions by Bremsstrahlung Analysis
14.50 – 15.15	Yu. Lashko <i>Bogolyubov Institute for Theoretical Physics, Ukraine</i> Role of the Pauli Principle in Cluster-Cluster Interaction
15.15 – 15.40	V. Vasilevsky <i>Bogolyubov Institute for Theoretical Physics, Ukraine</i> Effects of the Coulomb Interaction on Parameters of Resonance States in Mirror Three-Cluster Nuclei

EFFECTS OF THE COULOMB INTERACTION ON PARAMETERS OF RESONANCE STATES IN MIRROR THREE-CLUSTER NUCLEI

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The Coulomb interaction plays an important role in forming bound and resonance states of nuclear systems. It is interesting to study effects of the Coulomb interaction in mirror nuclei represented as a three-cluster structure. In the present report we study effects of the Coulomb interaction in mirror pair-nuclei ${}^7\text{Li}$ - ${}^7\text{Be}$, ${}^8\text{Li}$ - ${}^8\text{B}$, ${}^9\text{Be}$ - ${}^9\text{B}$, ${}^{11}\text{B}$ - ${}^{11}\text{C}$. We employ two microscopic three-cluster models to describe dynamics of these three-cluster systems. Energies of bound states, energies and widths of resonance states are obtained within the microscopic calculations by imposing proper boundary conditions for two- and three-cluster continuous spectrum states. Two parameters are introduced to quantify effects of the Coulomb interactions for resonance states. As the energy E and width Γ of the corresponding resonance states of the mirror nuclei are naturally to display on the $E - \Gamma$ plane, these parameters determine a rotation and a shift. With the help of these parameters we found resonance states with strong, small and medium effects of the Coulomb interaction.

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