II International Workshop on CLASSICAL AND QUANTUM INTEGRABLE SYSTEMS
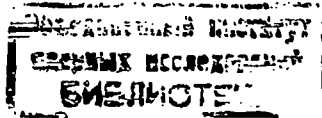
ALGEBRAIC METHODS AND LIE ALGEBRA CONTRACTIONS

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INFORMATION BOOKLET

INTEGRABLE MODEL OF INTERACTING FERMIONS CONFINED BY THE MORSE POTENTIAL

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The integrals of motion are constructed for the Sutherland hyperbolic systems of particles with internal degrees of freedom interacting with the Morse potential of an arbitrary strength τ^2. Thesee systems are confined if some constraint is imposed on τ, the strength of the pairwise interaction and the number of particles. The ground state is described by the wave function of the Jastrow form.

CONTRACTIONS OF LIE ALGEBRAS AND SEPARATION OF VARIABLES. TWO-DIMENSIONAL HYPERBOLOID

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The Inönü-Wigner contraction from the rotation group $O(2,1)$ to the Euclidean group $E(2)$ is used to relate the separation of variables in the Laplace-Beltrami operators on two corresponding homogeneous spaces. We consider the contractions on four levels: the Lie algebra, the commuting sets of second order operators in the enveloping of $o(2,1)$, the coordinate systems and some eigenfunctions of the Laplace-Beltrami operators. Different realizations of the contractions transform the nine separable coordinate systems on the hyperboloid L_2 into the four on the plane E_2.

GROUP CONTRACTIONS: INONU, WIGNER, EINSTEIN

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Einstein's $E = mc^2$ unifies the momentum-energy relation for massive and massless particles. According to Wigner, the internal space-time symmetries of massive and massless particles are isomorphic to $O(3)$ and $E(2)$ respectively. According to Inonu and