



## **AFFINELY-RIGID BODY AND OSCILLATORY TWO-DIMENSIONAL MODELS\***

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**Abstract.** Discussed are some classical and quantization problems of the affinely-rigid body in two dimensions. Strictly speaking, we consider the model of the harmonic oscillator potential and then discuss some natural anharmonic modifications. It is interesting that the considered doubly-isotropic models admit coordinate systems in which the classical and Schrödinger equations are separable and in principle solvable in terms of special functions on groups.

**MSC:** 22E70, 33C90, 37E30

**Keywords:** affinely-rigid body, quantization problems, two-dimensional models, harmonic oscillator potential, anharmonic modifications, doubly-isotropic models, Schrödinger equation, special functions, separability problem

### **1. Classical Description**

Let us consider two Euclidean spaces  $(N, U, \eta)$  and  $(M, V, g)$ , respectively the material and physical spaces. Here  $N$  and  $M$  are the basic point spaces,  $U$  and  $V$  are their linear translation spaces, and  $\eta \in U^* \otimes U^*$ ,  $g \in V^* \otimes V^*$  are their metric tensors.

The configuration space of the affinely-rigid body

$$Q := \text{Aff}(N, M)$$

consists of affine isomorphisms of  $N$  onto  $M$ . The material labels  $a \in N$  are parametrized by Cartesian coordinates  $a^K$  [1]. Cartesian coordinates in  $M$  will

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\*Reprinted from *Geometry, Integrability & Quantization* **16** (2015) 94-109  
doi: 10.7546/giq-16-2015-94-109.