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A report "**Mechanics of Affine Bodies. Towards Affine Dynamical symmetry**" was presented by prof. *Vasyl Kovalchuk,* who visits Institute of mechanics with his co-authors *Barbara Galibovska* and *Ewa Eliza Rozko*. They work in Institute of fundamental technological research at Polish academy of sciences.

Speaker started with an outline that contains "Introductory notes"; explanation of "Some basic concepts"; "Symmetries and conservation laws"; "Affine Dynamical models" and "Special case – 2D models". He explained certain dynamical models of affine bodies and discussed some problems of partial separability and integrability. There are some reasons to expect that the suggested models are dynamically viable and that on the fundamental level of physical phenomena the affine symmetry of dynamical laws is more justified and desirable than the restricted invariance under isometries.

Discussion

Some questions were riced although the audience was too small and understanding of the subject required a mathematical knowledge of highest level.

Prof. Ivailo Mladenov asked how hyperbolic potentials come into theory. Prof. Kovalchuk answered that these hyperbolic potentials are included in the whole scheme at the beginning and their appearance is explained in some previous publications.

Prof. Mladenov cleared his question pointing out that in this theory two points on a line are considered and there is an appropriate coordinate system and a new mechanical scheme has been applied there… V.K. answered that, in this model, distance between two points is not a line, but it is considered as a hyperbola.

As a next question, prof. Mladenov was interested to know - what are the advantages of using the approach of continuum mechanics, instead of that of Hamiltonian mechanics. Prof. V.K. answered that for him it was natural to prefer the first approach.

Assoc. prof. P. Djondjorov said that he imagines this approach as a mechanical model for the system, but some familiar terms as "*potential energy"* are not defined there. He asked what the new approach gives more in comparison with the classical one. Prof. V.K. replayed that they are different.

The classical approach is based on ideas from d'Alembert and Lagrange. The new approach is based on geometrically nice terms. It is more general and beautiful. The new approach is better, because we can model some situations, which cannot be modelled with the traditional one. For example, the model contains elastic vibrations in their generic form. He thinks the new model has better potential to describe the reality (within a solid body).

Assoc. prof. V. Vasilev recalled that he had seen equations of the motion which are a system of ordinary differential equations, like equations for points, and questioned if this is a theory for multibody system of points, or it is a continuum system or it is something – a hybrid system. Prof. V.K. explained that this system looks like ordinary differential equations, but nonlinear equations and they solve these equations by the help of a computer with initial statements as if it is a continuous system.

Assoc. prof. V. Vasilev and prof. V. Kovalchuk agreed that it is a good idea this new approach to be developed in the context of plates and shells.

Secretary: Assoc. prof. R. Krastev