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Classical and quantum collective dynamics of deformable objects. Symmetry and integrability problems. (English) [Zbl 1318.70013](#)

Mladenov, Ivaïlo M. (ed.) et al., Proceedings of the 5th international conference on geometry, integrability and quantization, Sts. Constantine and Elena (near Varna), Bulgaria, June 5–12, 2003. Sofia: Bulgarian Academy of Sciences (ISBN 954-84952-8-7/pbk). 81-108 (2004).

Summary: Discussed is an affine model of collective degrees of freedom of multi-particle systems or continuous media. The novelty of our approach is that it is not only kinematics, i.e. geometry of degrees of freedom, that is invariant under affine group, but rather we study affinely-invariant geodetic models of such affine systems. It is shown that the dynamics of bounded elastic vibrations may be encoded in such geodetic models in the very form of the kinetic energy expression. Some special solutions like the relative equilibria are discussed. We start with the general approach to group-theoretical degrees of freedom and then discuss peculiarities of the affine group and certain other groups underlying collective dynamics.

For the entire collection see [\[Zbl 1048.53002\]](#).

MSC:

[70H05](#) Hamilton's equations

[37N05](#) Dynamical systems in classical and celestial mechanics

[37N20](#) Dynamical systems in other branches of physics (quantum mechanics, general relativity, laser physics)

[70G45](#) Differential geometric methods (tensors, connections, symplectic, Poisson, contact, Riemannian, nonholonomic, etc.) for problems in mechanics

[74A99](#) Generalities, axiomatics, foundations of continuum mechanics of solids

Cited in 5 Documents

Full Text: [Euclid](#) [EMIS](#)