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Abstracts of Short Communications and Posters

Section:

11. Mathematical Physics

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Integrable generalizations of classical mechanical systems
Integrability of a dynamical system is an important but rare characteristic. We have started with classical integrable mechanical problems such as: the Jacobi problem for the geodesics on the ellipsoid, the Birkhoff billiard system within an ellipse, and within an ellipsoid. We have developed the method of constructing infinite dimensional families of perturbations of such systems, which are still integrable. We proved that in those systems the variables could be separated.
We derived the analytical conditions for a billiard trajectory within an ellipsoid in R^d to be periodic.
The ideas of integrable potential perturbations can be succesfully applied to nonholonomic problems also.
Some of the results are joint with B. Gajić, B. Jovanović and M. Radnović.