Quasi-periodic solutions of the Lennard-Jones 2-body problem

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The talk is devoted to show how to utilize Liapunov-type theorems to study the existence of quasi-periodic solutions close to relative equilibria, i.e. stationary points in rotating frame, that are degenerate due to rotational symmetry.

We show the application of this approach to the study of 2-body problem with Lennard-Jones potential which descibes intermolecular interactions. This problem possesses a one-parameter family of relative equilibria depending on the moment of inertia. We prove that on some range of the parameter there exist families of quasi-periodic solutions.

References

[1] D. Strzelecki. Periodic solutions of symmetric Hamiltonian systems. *Arch. Rational Mech. Anal.*, 237:921–950, 2020.

[2] D. Strzelecki. Bifurcations of quasi-periodic solutions from relative equlibria in the Lennard-Jones 2-body problem. *Celestial Mech. Dynam. Astronom*, art. 44, 2021.

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