RUHR-UNIVERSITÄT BOCHUM

FAKULTÄT FÜR MATHEMATIK

RUB

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Oberseminar Dynamische Systeme

On the Lagrange-Dirichlet converse in dimension three

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Abstract:

Abstract: In the context of mechanical systems, the Lagrange-Dirichlet Theorem states that a strict minimum of the potential is a Lyapunov stable equilibrium point. In his treatise of 1892, A. M. Lyapunov recognizes that the converse is non trivial and solves the first partial result. Since then, in the class of real analytic potentials, this problem remains as an open conjecture.

After reviewing the state of the art of the problem and possible alternative approaches, It will be shown that for a real analytic potential in dimension three, there is an open and dense subset of the set of non-strict local minimums of the potential whose points are Lyapunov unstable equilibria.

This will be achieved by proving a new instability criterion whose main ingredient is the new notion of weakly logarithmic vector field introduced in this work.

This is joint work with Miguel Paternain (<u>https://arxiv.org/abs/2208.01139</u>).

Guests are very welcome!