



Non-integrability of measure preserving maps via Lie symmetries

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Abstract

We consider the problem of characterizing, for certain natural number m , the local C^m -non-integrability near elliptic fixed points of smooth planar measure preserving maps. Our criterion relates this non-integrability with the existence of some Lie Symmetries associated to the maps, together with the study of the finiteness of its periodic points. One of the steps in the proof uses the regularity of the period function on the whole period annulus for non-degenerate centers, question that we believe that is interesting by itself. The obtained criterion can be applied to prove the local non-integrability of the Cohen map and of several rational maps coming from second order difference equations.

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