Geometrical Continued Fractions as Invariants in the Problem on Topological Classification of Anosov Diffeomorphisms of n-torus

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Recently it was found a deep connection between geometrical continued fractions in the sence of Klein and the problem on topological classification of Anosov diffeomorphisms of n-torus.

The problem on topological classsification of Anosov diffeomorphisms of n-torus appeared in sixties. The main progress in this problem was obtained by J. Franks, 1969 and C. Manning, 1973. They proved that every Anosov diffeomorfism of torus (of every dimension bigger than one) is topological conjugate to a linear hyperbolic automorphism. So initial problem was reduced to linear classification of hyperbolic (Anosov, linear) automorphisms of n-torus.

In the case $n = 2$ a solution of the last problem goes back to Gauss and Lagrange. A full invariant is the couple - the trace of the linear hyperbolic operator and the period of decomposition of the slope of a eigenvector of the operator into continued fraction. A geometrical interpretation of this invariant is the geometrical version of continued fraction constructed by Klein. So it is interesting to find "good" generalization of continued fraction for multidimensional case.

The main result of our work is that two hyperbolic automorphisms of n-torus are linear conjugated if and only if two corresponding geometrical continued fractions are linear equivalent.

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[2] O. N. Karpenkov, *On determination of periods of geometric continued fractions for two-dimensional algebraic hyperbolic operators*, arXiv: 0708.1604 (2007).

[3] G. Kolutsky, *Geometrical continued fractions as invariants in the problem on topological classification of Anosov diffeomorphisms of n-torus*, in progress.