

Zariski density of some Rauzy-Veech groups

Rodolfo Gutierrez

The Rauzy-Veech induction is a powerful renormalization algorithm for interval exchange transformations and translation flows closely related to the Kontsevich-Zorich cocycle. The combinatorics of the algorithm is modeled by the Rauzy classes. ‘ By computing the action on homology along the edges of a class, we obtain a Rauzy-Veech group. It was conjectured by Zorich that these groups are dense in the Zariski topology in $Sp(2g, \mathbb{R})$. This conjecture has many interesting dynamical consequences. In particular, it provides a generalization of the Avila-Viana proof of the simplicity of the Lyapunov spectrum of the Kontsevich-Zorich cocycle : the main ingredient of their proof is that Rauzy-Veech groups are pinching and twisting, which is implied by Zariski density by the work of Benoist.

In this talk I will present some recent advances on this conjecture. By the pioneering work of Avila-Matheus-Yoccoz, every hyperelliptic Rauzy-Veech group is Zariski-dense, and, more generally, has finite index in $Sp(2g, \mathbb{Z})$. Then, for the odd and even components of strata with a single zero, the Rauzy-Veech groups are the elements of $Sp(2g, \mathbb{Z})$ which, modulus 2, preserve the quadratic form that is used to define the parity of the spin. Therefore, they have finite index in $Sp(2g, \mathbb{Z})$ and the conjecture also holds in this case. This is a joint work with Carlos Matheus.