Instituto de Matemática e Estatística
Universidade Federal Fluminense

Seminário de Sistemas Dinâmicos da UFF

Rotation sets vs Entropy on irreducible annular continua

Alejandro Passeggi
Universidad de la República, Montevideo, Uruguay

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Resumo

The rotation set is a topological invariant of a dynamical system, which has shown to contain the essential information of the dynamics when the system acts in dimensions one and two.

When the rotation set turns to be big in certain sense with respect to the underlying space, several results shows a relation between the entropy of the map and the length of this invariant. For instance, if and endomorphism of the circle has a length one rotation set, then we have at least log of two entropy. In the torus, whenever the rotation set has positive interior, we have positive entropy, related to the geometry of the rotation set. Nevertheless, in the annulus we can have a interval as rotation set but zero entropy, as the twist maps show.

The question we attack is the following: assume that a map preserves an irreducible continuum which separates the plane in two components, is there a relation between the entropy and the length of the rotation interval?

The answer we find is negative, that is, we construct examples with arbitrary low entropy and rotation sets of length greater than or equal to one.

(Joint work with Rafael Potrie and Martín Sambarino).