Invariant islands for surface homeomorphisms

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Resumo/Abstract:

An invariant island of a surface homeomorphism is an invariant open topological disk. We will show that in the area-preserving setting the invariant islands are always bounded if the set of fixed points is contractible and the map is homotopic to the identity, and the same result also holds for toral homeomorphisms in the Dehn homotopy class.

For the case of toral homeomorphisms with a rotation set with nonempty interior, this leads to a decomposition of the dynamics into a disjoint union of bounded periodic islands and a complementary set with rich dynamical properties.

We will also discuss other applications of the same ideas. Joint works with Fabio A. Tal.