

Seminari de Geometria Algebraica 2016-2017

Divendres 31 de març a les 15:00, aula T2 FMI-UB

<http://www.ub.edu/sga/>

NEW ASPECTS OF HOMOCLINIC FLOER HOMOLOGY

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Floer homology was originally designed for counting the number of intersection points of two ‘nice’ Lagrangian submanifolds in a symplectic manifold. Applied to intersection problems of graphs of Hamiltonian diffeomorphisms, Floer homology ends up counting the number of 1-periodic solutions of the Hamiltonian system.

Since the stable and unstable manifold of a hyperbolic fixed point of a symplectomorphism are Lagrangian submanifolds, one may ask if there exists a Floer homology for this particular intersection problem. Since the (un)stable manifolds are usually only injectively immersed, not compact and ‘very wiggling’ the intersection problem is very complicated and in particular not very ‘analysis-friendly’. Intersection points of the stable and unstable manifold of the same fixed point are called homoclinic points.

Nevertheless, when working with symplectomorphisms on 2-dimensional manifolds, it is possible to replace parts of the analysis necessary for the construction of Floer theory by combinatorics and obtain a well-defined Floer homology generated by a special class of homoclinic points.

We will sketch the construction of homoclinic Floer homology and discuss (some of) its properties.
