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Title: Filling volumes and simplicial volume of mapping tori

Abstract:
Let M be an oriented closed manifold.

The integral filling volume and the real filling volume are two maps associating a positive real value to every orientation preserving self-homotopy equivalence of the manifold M.
These two maps are defined in terms of filling norms and they measure how much mixing is a homotopy equivalence on real fundamental cycles and integral fundamental cycles.
The interest in the real filling volume arises from the strong connections that it has with another numerical invariant associated to compact manifolds, namely the simplicial volume: this famous invariant was introduced by Gromov in the early '80s and it measures the complexity of a manifold in terms of singular simplices.
Even if the simplicial volume is defined from a topological point of view, it is deeply related with the geometric structure that a manifold can carry: for example, it is always positive on manifolds admitting a negatively curved Riemannian metric, while it vanishes on flat manifolds.
During the talk we will introduce the integral filling volume and the real filling volume.
We will state some vanishing results and we will study various properties; in particular, we will see that they are homotopy invariants and, thus, they give well defined maps on MCG(M).
We will investigate the connections existing between the real filling volume of an orientation preserving self-homeomorphism f of M and the simplicial volume of the mapping torus associated to the map f.
From these connections we will deduce several vanishing results of the simplicial volume and obtain interesting results about the real filling volume.

Finally, we will discuss the relationship between the integral filling volume of an orientation preserving self-homeomorphism f and the stable integral simplicial volume of the mapping torus associated to f.