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Topology of isotopy complexes

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Abstract

The group of isotopy classes of diffeomorphisms of a manifold acts on various complexes whose vertices correspond to isotopy classes of geometric objects in the manifold. Two well-known examples are the curve complex (where the objects are simple closed curves in a surface) and the spine of outer space (where the objects are 2-spheres embedded in a doubled handlebody). A key feature of such complexes is the fact that they are often highly connected. I will explain some general methods of proving this, and will illustrate them on the curve complex. I will then deduce some new results, including high-connectivity for the complex of separating curves in a surface, a complex which is interesting for the study of the Torelli group.

This is joint work with Allen Hatcher.