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Graph complexes, operadic mapping spaces and embedding calculus - a survey

Thursday, September 1, 2022 5:00 PM (50 minutes)

I propose to give an account on results of a collaboration with Victor Turchin and Thomas Willwacher about rational models of operads operads and their applications to the study of the rational homotopy type of embedding spaces.

In a preliminary part, I will give a brief review of the rational homotopy theory of operads. Then I will explain a graph complex description of the rational homotopy of mapping spaces of E_n-operads, and applications of results of the Goodwillie-Weiss calculus of embeddings to check that this computation gives a description of a delooping of embedding spaces of Euclidean spaces. If time permit, I will also explain a generalization of our constructions for the computation of the rational homotopy of the embedding spaces of manifolds into Euclidean spaces.

The homotopy automorphism spaces of E_n-operads represent generalizations of the Grothendieck-Teichmüller, which concern the case $n = 2$. These spaces have a description in terms of graph complexes too, and another option (depending on the interests of the audience) is to explain this result in detail, giving in particular some precision on the computation of the monoid structure associated to these spaces.

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