THOUGHTS ON SECTIONAL CATEGORY AND RELATIVE COHOMOLOGY

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The Lusternik-Schnirelmann category of a space, and Farber's topological complexity [1], are particular examples of a more general notion, the sectional category, introduced by Schwarz in [2]. A famous theorem due to Eilenberg and Ganea, [3] gives a characterization of the LS category of an aspherical space as the cohomological dimension of its fundamental group (for dimension greater than 3). In the context of topological complexity, the generalization of the theorem of Eilenberg and Ganea, or any other algebraic characterization of the TC of aspherical spaces, remain as one of the most interesting open problems. Recently, in [4] Farber, Grant, Lupton and Oprea have used the tools of Bredon equivariant cohomology, developed by Bredon in [5], to offer new cohomological bounds for topological complexity of aspherical spaces. We consider a different cohomology theory, a notion of relative cohomology due to Adamson, [6]. This notion has the advantage of being bounded above by Bredon, so it is interesting to consider it as a candidate for a finer bound for TC of groups. We will study the relationship with the Bredon one, and whether if it is possible to obtain relevant information for sectional category of subgroups inclusions.

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