

SEQUENTIAL PARAMETRIZED TOPOLOGICAL COMPLEXITY OF GROUP EPIMORPHISMS

NAVNATH DAUNDKAR

ABSTRACT. We introduce and study the sequential analogue of Grant’s parametrized topological complexity of group epimorphisms, which generalizes the sequential topological complexity of groups. We derive bounds for sequential parametrized topological complexity based on the cohomological dimension of certain subgroups, thereby extending the corresponding bounds for sequential topological complexity of groups. We also obtain sequential analogs of (new) lower bounds on parametrized topological complexity of epimorphisms which are recently obtained by Espinosa Baro, Farber, Mescher and Oprea. Finally, we utilize these results to provide alternative computations for the sequential parametrized topological complexity of planar Fadell–Neuwirth fibrations.

1. Introduction

The *topological complexity* of a space X , denoted by $\text{TC}(X)$ is defined as the least positive integer r for which $X \times X$ can be covered by open sets $\{U_0, \dots, U_r\}$, such that each U_i admits a continuous local section of the free path space fibration

$$\pi: X^I \rightarrow X \times X \quad \text{defined by} \quad \pi(\gamma) = (\gamma(0), \gamma(1)),$$

where X^I denotes the free path space of X with a compact open topology. Farber [17] introduced the concept of topological complexity to analyze the difficulty

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