

## Complex analytic methods for virtual properties of mapping class groups

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**Abstract.** The mapping class group  $\text{Mod}(\Sigma)$  of a closed topological surface  $\Sigma$  is the group of connected components of orientation-preserving diffeomorphisms of  $\Sigma$ . These groups are well-studied, however very little is known about their finite index subgroups. One prominent open problem in this field is a question of Ivanov: does  $\text{Mod}(\Sigma)$  admit a finite index subgroup with a finite abelianization? Since  $\text{Mod}(\Sigma)$  is the étale fundamental group of the moduli space  $\mathcal{M}(\Sigma)$  of Riemann surfaces homeomorphic to  $\Sigma$ , this question of Ivanov naturally relates to homology of finite covers of  $\mathcal{M}(\Sigma)$ . Using this approach, many results have been obtained in recent years using both Teichmüller theoretic and complex geometric methods [5, 6, 1, 7], as well as the methods of algebraic geometry [3, 2, 4]. In this talk, we will give a general introduction to the field and present some of these results.

**Keywords:** Mapping class group; Moduli space; Teichmüller space

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