

Subgroup Separability and Applications to 3-Manifold Groups

Emily Hamilton

California Polytechnic State University

A subset X of a group Γ is *separable* in Γ if it is closed in the profinite topology on Γ . A group Γ is (i) *residually finite* if the trivial subgroup is separable, (ii) *subgroup separable* if every finitely generated subgroup of Γ is separable, and (iii) *conjugacy separable* if every conjugacy class in Γ is separable. Separability has applications in geometric group theory and geometric topology. If a finitely presented group Γ is residually finite, then Γ has a solvable word problem, meaning that there exists an algorithm to decide if a given word in the presentation of Γ is trivial. If Γ is subgroup separable, then Γ has a solvable generalized word problem. If Γ is conjugacy separable, then Γ has a solvable conjugacy problem. In the context of geometric topology, separability has been used to solve immersion to embedding problems. For example, in 3-manifold topology, subgroup separability allows passage from immersed incompressible surfaces to embedded incompressible surfaces in finite covers. In this talk, we prove results related to conjugacy separability for fundamental groups of hyperbolic 3-manifolds of finite volume, and describe some geometric applications.

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