

Table of Contents

Introduction	VII
Chapter I. Trees and Amalgams	1
§1 <i>Amalgams</i>	1
1.1 Direct limits.	1
1.2 Structure of amalgams	2
1.3 Consequences of the structure theorem	5
1.4 Constructions using amalgams	8
1.5 Examples	11
§2 <i>Trees</i>	13
2.1 Graphs	13
2.2 Trees	17
2.3 Subtrees of a graph	21
§3 <i>Trees and free groups</i>	25
3.1 Trees of representatives	25
3.2 Graph of a free group	26
3.3 Free actions on a tree	27
3.4 Application: Schreier's theorem	29
Appendix: Presentation of a group of homeomorphisms	30
§4 <i>Trees and amalgams</i>	32
4.1 The case of two factors	32
4.2 Examples of trees associated with amalgams	35
4.3 Applications	36
4.4 Limit of a tree of groups	37
4.5 Amalgams and fundamental domains (general case)	38
§5 <i>Structure of a group acting on a tree</i>	41
5.1 Fundamental group of a graph of groups	41
5.2 Reduced words	45
5.3 Universal covering relative to a graph of groups . .	50
5.4 Structure theorem	54
5.5 Application: Kurosh's theorem	56
§6 <i>Amalgams and fixed points</i>	58
6.1 The fixed point property for groups acting on trees	58
6.2 Consequences of property (FA)	59

VI Table of Contents

6.3 Examples	60
6.4 Fixed points of an automorphism of a tree	61
6.5 Groups with fixed points (auxiliary results)	64
6.6 The case of $\mathrm{SL}_3(\mathbf{Z})$	67
Chapter II. SL_2	69
§1 <i>The tree of SL_2 over a local field</i>	69
1.1 The tree	69
1.2 The groups $\mathrm{GL}(V)$ and $\mathrm{SL}(V)$	74
1.3 Action of $\mathrm{GL}(V)$ on the tree of V ; stabilizers	76
1.4 Amalgams.	78
1.5 Ihara's theorem.	82
1.6 Nagao's theorem	85
1.7 Connection with Tits systems	89
§2 <i>Arithmetic subgroups of the groups GL_2 and SL_2 over a function field of one variable</i>	96
2.1 Interpretation of the vertices of $\Gamma \backslash X$ as classes of vector bundles of rank 2 over C	96
2.2 Bundles of rank 1 and decomposable bundles	99
2.3 Structure of $\Gamma \backslash X$	103
2.4 Examples	111
2.5 Structure of Γ	117
2.6 Auxiliary results	120
2.7 Structure of Γ : case of a finite field	124
2.8 Homology.	125
2.9 Euler-Poincaré characteristic	131
Bibliography	137
Index	141