

Contents

Introduction	vii
Chapter 1. Eigenfunctions of the hyperbolic Laplace operator	1
1. Eigenfunctions on the hyperbolic plane	1
2. Principal series	4
3. Boundary germs and transverse Poisson transform	10
4. Averages	15
Chapter 2. Maass forms and analytic cohomology: cocompact groups	21
5. From Maass forms to analytic cohomology	21
6. Cohomology for cocompact groups	24
7. From cohomology to Maass forms	31
Chapter 3. Cohomology of infinite cyclic subgroups of $\mathrm{PSL}_2(\mathbb{R})$	39
8. Invariants	39
9. Coinvariants	44
Chapter 4. Maass forms and semi-analytic cohomology: groups with cusps	61
10. Maass forms	61
11. Cohomology and parabolic cohomology for groups with cusps	64
12. Maass forms and cohomology	73
13. Parabolic cohomology and mixed parabolic cohomology	79
14. Period functions and periodlike functions for the full modular group	84
15. Maass forms and holomorphic functions	91
Chapter 5. Maass forms and differentiable cohomology	95
16. Differentiable parabolic cohomology	95
17. Smooth parabolic cohomology	112
Chapter 6. Distribution cohomology and Petersson product	115
18. Distribution cohomology	115
19. Duality	117
Bibliography	127
Index	129
List of notations	131