

Contents

Chapter 1. Introduction	1
1.1. Diamonds	1
1.2. Full loci of covers	2
1.3. Abelian and quadratic doubles	4
1.4. Additional remarks	6
Chapter 2. The Diamond Lemma	9
Chapter 3. Preliminaries on orbit closures	15
3.1. Rank and rel	15
3.2. Field of definition and translation covers	15
3.3. Point markings	16
3.4. Cylinder deformations	18
3.5. The boundary of an invariant subvariety	20
3.6. Generic diamonds	22
Chapter 4. Preliminaries on strata	27
4.1. Cylinders	28
4.2. Hyperelliptic components of strata	30
4.3. S -paths	32
Chapter 5. Diamonds with a stratum of Abelian differentials	35
Chapter 6. Gluing in a complex envelope	39
6.1. Preliminaries on horizontally periodic surfaces	42
6.2. Abundance of diamonds	44
6.3. Proof of Theorem 6.3 when $\mathcal{F}(\mathcal{Q})$ is hyperelliptic	46
6.4. The Hyperelliptic Diamond Lemma	52
6.5. Conclusion of the proof of Theorem 6.3	55
6.6. Open problems	61
Chapter 7. Diamonds with quadratic doubles	63
Chapter 8. Diamonds of full loci of covers	71
8.1. Preliminaries	72
8.2. Higher rank	74
8.3. Rank 1, not dimension 2	77
8.4. Rank 1, dimension 2	83
8.5. A special case	89
8.6. Open problems	89
Chapter 9. Hyperelliptic components	91

9.1.	Hyperelliptic components of quadratic differentials	91
9.2.	Simultaneous quadratic and Abelian doubles	93
9.3.	Cylinders in hyperelliptic components of Abelian differentials	95
Chapter 10.	Diamonds with Abelian and quadratic doubles	97
10.1.	Basic structural results	101
10.2.	The Collapsing Lemma	103
10.3.	Weak translation symmetry	106
10.4.	Extra symmetry case	109
10.5.	When \mathbf{C}_1 consists of half-simple or complex cylinders	116
10.6.	When \mathbf{C}_1 is a simple cylinder	121
10.7.	When \mathbf{C}_1 is a pair of simple cylinders	126
10.8.	Supplemental statements in case 3b	129
	Acknowledgments	137
	Bibliography	139