

# Contents

Introduction . . . . .	1
Chapter I. Basic Properties of Quasiregular Mappings . . . . .	4
1. $\text{ACL}^p$ Mappings . . . . .	4
2. Quasiregular Mappings . . . . .	10
3. Examples . . . . .	13
4. Discrete Open Mappings . . . . .	16
Chapter II. Inequalities for Moduli of Path Families . . . . .	24
1. Modulus of a Path Family . . . . .	24
2. The $K_O$ -Inequality . . . . .	30
3. Path Lifting . . . . .	32
4. Linear Dilatations . . . . .	35
5. Poletskii's Lemma . . . . .	39
6. Characterizations of Quasiregularity . . . . .	42
7. Proof of Poletskii's Lemma . . . . .	45
8. Poletskii's Inequality . . . . .	49
9. Väisälä's Inequality . . . . .	51
10. Capacity Inequalities . . . . .	53
Chapter III. Applications of Modulus Inequalities . . . . .	59
1. Global Distortion . . . . .	59
2. Sets of Capacity Zero and Singularities . . . . .	64
3. The Injectivity Radius of a Local Homeomorphism . . . . .	68
4. Local Distortion . . . . .	71
5. Bounds for the Local Index . . . . .	73
Chapter IV. Mappings into the $n$ -Sphere with Punctures . . . . .	78
1. Coverings Averages . . . . .	78
2. The Analogue of Picard's Theorem . . . . .	81
3. Mappings of a Ball . . . . .	89
Chapter V. Value Distribution . . . . .	94
1. Defect Relation . . . . .	94
2. Coverings and Decomposition of Balls . . . . .	97

3. Estimates on Liftings . . . . .	101
4. Extremal Maximal Sequences of Liftings . . . . .	105
5. Effect of the Defect Sum on the Liftings . . . . .	108
6. Completion of the Proof of Defect Relations . . . . .	111
7. Mappings of the Plane . . . . .	116
8. Order of Growth . . . . .	120
9. Further Results . . . . .	124
Chapter VI. Variational Integrals and Quasiregular Mappings . . . . .	129
1. Extremals of Variational Integrals . . . . .	130
2. Extremals and Quasiregular Mappings . . . . .	135
3. Growth Estimates for Extremals . . . . .	137
4. Differentiability of Quasiregular Mappings . . . . .	142
5. Discreteness and Openness of Quasiregular Mappings . . . . .	145
6. Pullbacks of General Kernels . . . . .	148
7. Further Properties of Extremals . . . . .	152
8. The Limit Theorem . . . . .	157
Chapter VII. Boundary Behavior . . . . .	162
1. Removability . . . . .	162
2. Asymptotic and Radial Limits . . . . .	168
3. Continuity Results and the Reflection Principle . . . . .	174
4. The Wiener Condition . . . . .	180
5. $F$ -Harmonic Measure . . . . .	184
6. Phragmén–Lindelöf Type Theorems . . . . .	187
7. Asymptotic Values . . . . .	193
Bibliography . . . . .	198
List of Symbols . . . . .	208
Index . . . . .	210