

Contents

Chapter 1. Introduction	1
Chapter 2. Definitions of Polyhedra, Their Faces and Cones	5
2.1. Polyhedron	5
2.2. Faces of Polyhedron	7
2.3. A Cone (Dual Face) of Face	8
2.4. Generalized Newton Polyhedron	9
2.5. Basic Decompositions According to Faces and Cones	10
Chapter 3. Main Theorem and Background	13
3.1. Even Sets	13
3.2. Statement of Main Results	14
3.3. Background	17
Chapter 4. Combinatorial Lemmas	23
4.1. Elementary properties of faces and dual faces	23
4.2. Low Dimensional Polyhedron in \mathbb{R}^n	24
4.3. Properties of Boundary and Interior of Face	26
4.4. Representations of Faces	27
4.5. Representations of Cones (Dual Faces)	29
4.6. Cone Decompositions	34
4.7. Projective Cone; Boundary Deleted Neighborhood	36
4.8. Representations of Unbounded Faces	40
4.9. Essential Faces	41
4.10. Invariance Property under Isomorphism	43
Chapter 5. Descending Faces vs. Ascending Cones	45
5.1. Construction of Descending Faces and Ascending Cones	46
5.2. Size Control Number	51

Chapter 6. Preliminary Results of Analysis	55
6.1. Preliminary Inequalities	55
6.2. Basic L^p estimates	56
Chapter 7. Proof of Sufficiency	59
7.1. Statement of Sufficiency Theorem	59
7.2. Main Estimate for Low Rank Case	60
7.3. Proof of Theorem 7.1	62
Chapter 8. Necessity Theorem	71
8.1. Transitivity Rule for Dual Faces	71
8.2. Lemma for Necessity	75
8.3. Necessity Theorem	77
Chapter 9. Preliminary Lemmas for Necessity Proof	81
9.1. Exclusiveness of Odd Sets	81
9.2. Scheme of Necessity Proof	89
Chapter 10. Proof of Necessity	93
10.1. Proof of Lemma 9.2	93
10.2. Proof of Lemma 9.3	97
Chapter 11. Proofs of Corollary 3.1 and Main Theorem 3.1	103
11.1. Proof of Corollary 3.1	103
11.2. Proof of Sufficient Part of Main Theorem 3.1	105
11.3. Proof of Necessity Part of Main Theorem 3.1	108
Chapter 12. Appendix	113
Bibliography	119