

Contents

1	Introduction and Survey	1
1.1	How We Got Here	1
1.2	What is a Higher Matrix Factorization?	7
1.3	What's in This Book?	11
1.4	Notation and Conventions	15
2	Matrix Factorizations of One Element	19
2.1	Matrix Factorizations and Resolutions over a Hypersurface	19
3	Finite Resolutions of HMF Modules	23
3.1	The Minimal S -Free Resolution of a Higher Matrix Factorization Module	23
3.2	Consequences	29
3.3	Building a Koszul Extension	33
3.4	Higher Homotopies	34
4	CI Operators	37
4.1	CI Operators	37
4.2	The Action of the CI Operators on Ext	40
4.3	Resolutions with a Surjective CI Operator	44
5	Infinite Resolutions of HMF Modules	49
5.1	The Minimal R -Free Resolution of a Higher Matrix Factorization Module	49
5.2	Betti Numbers	56
5.3	Strong Matrix Factorizations	58
5.4	Resolutions over Intermediate Rings	60
6	Far-Out Syzygies	63
6.1	Pre-stable Syzygies and Generic CI Operators	63
6.2	The Graded Case	70
6.3	The Box Complex	72
6.4	From Syzygies to Higher Matrix Factorizations	76
6.5	Betti Numbers of Pre-stable Matrix Factorizations	82

7	The Gorenstein Case	85
7.1	Syzygies and Maximal Cohen-Macaulay Modules.....	85
7.2	Stable Syzygies in the Gorenstein Case.....	86
7.3	Maximal Cohen-Macaulay Approximations.....	87
7.4	Stable Matrix Factorizations over a Gorenstein Ring	91
8	Functoriality	95
8.1	HMF Morphisms	95
	References	103
	Index	107

Minimal Free Resolutions over Complete Intersections

Eisenbud, D.; Peeva, I.

2016, X, 107 p., Softcover

ISBN: 978-3-319-26436-3