

Contents

1	Introduction	1
1.1	A brief history of quasisymmetric functions	1
2	Classical combinatorial concepts	5
2.1	Partially ordered sets	5
2.2	Compositions and partitions	7
2.3	Partition diagrams	9
2.4	Young tableaux and Young's lattice	11
2.5	Reverse tableaux	14
2.6	Schensted insertion	16
3	Hopf algebras	19
3.1	Hopf algebra basic theory	19
3.2	The Hopf algebra of symmetric functions	24
3.2.1	Products and coproducts	29
3.2.2	Duality	31
3.3	The Hopf algebra of quasisymmetric functions	32
3.3.1	Products and coproducts	34
3.3.2	P -partitions	36
3.4	The Hopf algebra of noncommutative symmetric functions	44
3.4.1	Products and coproducts	46
3.4.2	Duality	46
3.5	Relationship between Sym, QSym, and NSym	47
3.6	Automorphisms	47
3.7	Combinatorial Hopf algebras	49
4	Composition tableaux and further combinatorial concepts	51
4.1	Young composition tableaux and the Young composition poset	51
4.2	Reverse composition tableaux and the reverse composition poset	55
4.3	Bijections between composition tableaux and other tableaux	59

5 Quasisymmetric Schur functions	63
5.1 Original quasisymmetric Schur functions.....	63
5.2 Young quasisymmetric Schur functions	65
5.3 Pieri and Littlewood-Richardson rules in QSym using reverse composition tableaux	68
5.4 Pieri and Littlewood-Richardson rules in QSym using Young composition tableaux	72
5.5 Pieri and Littlewood-Richardson rules in NSym using reverse composition tableaux	77
5.6 Pieri and Littlewood-Richardson rules in NSym using Young composition tableaux	79
References	83
Index	87

An Introduction to Quasisymmetric Schur Functions
Hopf Algebras, Quasisymmetric Functions, and Young
Composition Tableaux

Luoto, K.; Mykytiuk, S.; van Willigenburg, S.

2013, XIV, 89 p. 75 illus., Softcover

ISBN: 978-1-4614-7299-5