
Contents

1	INTRODUCTION	1
2	PRELIMINARIES	7
2.1	The Temperley-Lieb algebra, the blob algebra, the Hecke algebras	7
2.2	The Khovanov-Lauda-Rouquier algebra	11
3	DIAGRAMS ALGEBRAS AND COMBINATORICS OF TABLEAUX	15
3.1	Diagram basis for $Tl_n(q)$	15
3.2	Diagram basis for b_n	18
3.3	Walks on the Bratteli diagram	23
4	GRADED REPRESENTATION THEORY	29
4.1	Basic definitions	29
4.2	Graded cellular algebras	31
4.3	Grading $Tl_n(q)$ and $b_n(m)$	33
4.3.1	Grading $Tl_n(q)$	33
4.3.2	Grading $b_n(m)$	34
5	GRADED CELLULAR BASIS FOR $Tl_n(q)$ AND $b_n(m)$	37
5.1	Jucys-Murphy elements on $b_n(m)$	37
5.2	Graded cellular basis for $Tl_n(q)$ and $b_n(m)$	45
5.3	Examples	51
6	GRADED DECOMPOSITION NUMBER FOR $b_n(m)$	55
6.1	Degree function	56
6.2	Graded decomposition numbers	63
6.2.1	The non-wall case.	65
6.2.2	The wall case.	73
	BIBLIOGRAPHY	76