

1123-05-64

Darij Grinberg* (darijgrinberg@gmail.com), 515 Huron Blvd SE, Apt 207T, Minneapolis, MN 55414. *Sign functions for reduced expressions in Coxeter groups: proof of a conjecture of Bergeron, Ceballos and Labbé.*

The reduced expressions for a given element w of a Coxeter group (W, S) can be regarded as the vertices of a directed graph $\mathcal{R}(w)$; its arcs correspond to the braid moves. Specifically, an arc goes from a reduced expression \vec{a} to a reduced expression \vec{b} when \vec{b} is obtained from \vec{a} by replacing a contiguous subword of the form $stst\cdots$ (for some distinct $s, t \in S$) by $tsts\cdots$ (where both subwords have length $m_{s,t}$, the order of $st \in W$). We prove a strong bipartiteness-type result for this graph $\mathcal{R}(w)$: Not only does every cycle of $\mathcal{R}(w)$ have even length; actually, the arcs of $\mathcal{R}(w)$ can be colored (with colors corresponding to the type of braid moves used), and to every color c corresponds an “opposite” color c^{op} (corresponding to the reverses of the braid moves with color c), and for any color c , the number of arcs in any given cycle of $\mathcal{R}(w)$ having color in $\{c, c^{\text{op}}\}$ is even. This generalizes and improves a 2014 result by Bergeron, Ceballos and Labbé.

After stating the results and briefly discussing the idea of the proof, I shall present a few conjectural generalizations. (Received August 14, 2016)