

1146-20-12

Glenn Appleby* (gappleby@scu.edu) and **Tamsen Whitehead**. *Perforated Tableaux Provide a Unified Combinatorial Model for Crystal Operators, Tensor Products,, and Lusztig Involutions.*

We present a combinatorial model, called *perforated tableaux*, to study A_n crystals, unifying several combinatorial models “under one roof”. Nodes of the standard A_n crystal graph are integers $[n] = \{1, 2, \dots, n\}$. One can identify nodes in the crystal tensor product $[n]^{\otimes k}$ with length k words in $[n]$. We replace words with perforated tableaux (ptableaux) and use them to simplify crystal operators and identify highest weights visually without computation (for *all* crystals directly, without reference to a canonical model B_ν of semistandard Young tableaux (SSYT) of shape ν). We generalize the tensor products in the Littlewood-Richardson rule to all of $[n]^{\otimes k}$, and not just the irreducible crystals whose reading words come from SSYT. We relate evacuation (Lusztig involution) to products of ptableaux crystal operators, and find a natural bi-crystal structure on all crystals of a fixed isomorphism class. (Received October 26, 2018)