

External Littelmann Paths For Crystals Of Type A, rank 2

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Our research is in the representation theory of affine Lie algebras of type A. The basis elements of a highest weight representations with highest weight Λ of level r , organized into a Kashiwara crystal, have three combinatorial representations: as multipartitions, as Littelmann paths and as canonical basis elements, whose are currently constructed recursively. One motivation for studying these crystals is from the Chuang-Rouquier theory of categorification, by which the basis elements correspond to the simple modules of the cyclotomic Hecke algebras of weight Λ .

In our research, we concentrate on basis elements at the ends of strings, which we call external, and we find a particular kind of standard LS-representation for Littelmann paths. In the case of $e = 2$ there is a criterion by Mathas for the e -regular multipartitions, and we give a non-recursive construction of the corresponding Littelmann paths. In $e = 3$ we prove this existence of standard LS-representation for a few limited cases also find families of multipartitions which cannot be standard.