

**A NONVANISHING CONDITION FOR $A_{\mathfrak{q}}(\lambda)$ OF $U(p, q)$ IN THE
WEAKLY FAIR RANGE**

Abstract. Given an $A_{\mathfrak{q}}(\lambda)$ module of $U(p, q)$, its associated variety and annihilator can be described by a pair of Young tableaux. Using the view of Young tableaux, Trapa developed an algorithm to compute the Young tableaux for annihilators when λ is in the weakly fair range for \mathfrak{q} . The algorithm provides an sufficient and necessary nonvanishing condition for $A_{\mathfrak{q}}(\lambda)$. However, the algorithm relies on the "overlap", which requires heavy work on Young tableaux. For the "overlap", We provide an easy formula which avoids the Young tableaux. As an application, we extend the lowest K -type formula to the case when λ is in the nice range for \mathfrak{q} .