VERMA MODULES FOR QUANTUM SYMMETRIC PAIRS

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Abstract:
We construct Verma modules for quasi-split type AIII quantum symmetric pairs as induced modules. For this we use the Kolb–Yakimov *star product* to construct Cartan subalgebras uniformly in both subfamilies in this type. Then we construct a weak triangular decomposition of the coideal subalgebra into $U'_< \otimes U'_\circ \otimes U'_>$ via the *Letzter map*. This decomposition is weak because $U'_\circ \otimes U'_>$ is not a subalgebra. We show that these Verma modules have unique irreducible quotients and distinguish irreducible finite dimensional modules up to isomorphism. If time permits, I will also discuss the small example of $U'_q(\mathfrak{gl}_2 \times \mathfrak{gl}_2) \subset U_q(\mathfrak{gl}_4)$. In this case $U'_\circ \otimes U'_>$ is in fact a subalgebra, and we introduce a family of *magical operators* to classify Verma modules that admit weight space decompositions. This also leads to an explicit weight basis of their irreducible quotients.