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Centralizers of products of $LU_q(\mathfrak{sl}_2)$-modules at roots of unity

Let V be the fundamental representation of the quantum group $U_q(\mathfrak{sl}_2)$. Quantum Schur-Weyl duality says that the centralizer of the action of $U_q(\mathfrak{sl}_2)$ on the product $V^{\otimes n}$ is isomorphic to the Temperley-Lieb algebra $\mathsf{TL}_n(q+q^{-1})$, even when q is a root of unity (in which case we consider the action of Lusztig's extension $LU_q(\mathfrak{sl}_2)$). We explore products other than $V^{\otimes n}$, namely we describe the centralizer of the action of $LU_q(\mathfrak{sl}_2)$ on $P\otimes V^{\otimes n}$, where P is a projective $LU_q(\mathfrak{sl}_2)$-module. We give a complete description of the algebra $\mathsf{End}_{LU_q(\mathfrak{sl}_2)}(P\otimes V^{\otimes n})$ in both cases when q is a root of unity or not. This is joint work with Yvan Saint-Aubin.