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$SU(2)$ and $SL(2,\mathbb{C})$ Representations of a Class of Torus Knots

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Abstract: Let $K_{m,2}$ be the torus knot of type $(m,2)$. With the help of the explicit description of the $SL(2,\mathbb{C})$ character variety of this class of torus knots given by the author in a previous work, we study the relationship between the representations over $SU(2)$ and over $SL(2,\mathbb{C})$ of the fundamental group of $S^3 \setminus K_{m,2}$. In particular it is shown that the map from the moduli space of irreducible $SU(2)$-representations to the moduli space of $SL(2,\mathbb{C})$-representations is injective.

Key words: Character variety, Representation variety, Torus knot, $SU(2)$, $SL(2,\mathbb{C})$.

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