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Charles D Frohman* (charles-frohman@uiowa.edu), Department of Mathematics, The University of Iowa, Iowa City, IA 52242. *Positivity of the Kauffman Bracket Skein Algebra of the Torus.*

The Kauffman bracket skein algebra $S^{-1}K_N(T^2)$ of the torus at a $2N$ th root of unity, localized to be an algebra over the function field of the character variety of the fundamental group of the torus is Frobenius. This gives rise to a pairing

$$\beta : K_N(T^2) \otimes K_N(T^2) \rightarrow \chi(T^2),$$

where $\chi(T^2)$ denotes the ring of $SL_2\mathbb{C}$ -characters of the fundamental group of T^2 .

Since $SU(2) \rightarrow Sl_2\mathbb{C}$ we can restrict $SL_2\mathbb{C}$ -characters of $\pi_1(T^2)$ to be $SU(2)$ characters. We say that $f \in \chi(T^2)$ is positive if for every $\rho : \pi_1(T^2) \rightarrow SU(2)$, $f(\rho)$ is real and positive.

We prove that for all nonzero skeins $s \in K_N(T^2)$ that are real linear combinations of simple diagrams on the torus,

$$\beta(s, s) > 0$$

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