1163-57-140   **David Boozer*** (`adboozer@princeton.edu`). *Computer Bounds for Kronheimer-Mrowka Foam Evaluation.*

Kronheimer and Mrowka recently suggested a possible approach towards a new proof of the four color theorem that does not rely on computer calculations. Their approach is based on a functor $J^\sharp$, which they define using gauge theory, from the category of webs and foams to the category of vector spaces over the field of two elements. They also consider a possible combinatorial replacement $J^\flat$ for $J^\sharp$. Of particular interest is the relationship between the dimension of $J^\flat(K)$ for a web K and the number of Tait colorings $\mathrm{Tait}(K)$ of K; these two numbers are known to be identical for a special class of "reducible" webs, but whether this is the case for nonreducible webs is not known. We describe a computer program that strongly constrains the possibilities for the dimension and graded dimension of $J^\flat(K)$ for a given web K, in some cases determining these quantities uniquely. We present results for a number of nonreducible example webs. For the dodecahedral web W_1 the number of Tait colorings is $\mathrm{Tait}(W_1) = 60$, but our results suggest that $\dim J^\flat(W_1) = 58$. (Received August 20, 2020)