2-Primary Exponent Bounds for Lie Groups of Low Rank

Stephen D. Theriault

Abstract. Exponent information is proven about the Lie groups $SU(3)$, $SU(4)$, $Sp(2)$, and $G_2$ by showing some power of the $H$-space squaring map (on a suitably looped connected-cover) is null homotopic. The upper bounds obtained are 8, 32, 64, and $2^8$ respectively. This null homotopy is best possible for $SU(3)$ given the number of loops, off by at most one power of 2 for $SU(4)$ and $Sp(2)$, and off by at most two powers of 2 for $G_2$.