

$SL_3(\mathbb{Z})$

I will discuss conjugation invariant word norms on $SL(3, \mathbb{Z})$. By definition, such a norm is the word norm associated with a generating set which is invariant under conjugation. It follows from the bounded generation property (due to Carter and Keller) that every conjugation invariant word norm on $SL(3, \mathbb{Z})$ has finite diameter. The diameter, of course, depends on the choice of a generating set. It is not difficult to show that there are generating sets with arbitrarily large diameters (I will show examples). I will prove that if a generating set consists of bounded number of conjugacy classes then the associated diameters are uniformly bounded. I will discuss applications to finite simple groups $PSL(3, q)$. All results generalise to $SL(n, \mathbb{Z})$ for $n > 2$.

This is a joint work with Assaf Libman and Ben Martin.