Ergodic Operator Inequalities for Unimodular Amenable Groups through Random Walks

Ujan Chakraborty

Existing proofs of pointwise ergodic theorems for amenable groups are quite involved. This is principally due to the difficulty in obtaining the maximal inequality. Assuming unimodularity, we provide a new and transparent proof of these theorems using random walks that deals with the classical and noncommutative cases on an equal footing. We show that one may dominate the average on the group by that on the integers (a Markov operator). Maximal inequalities and pointwise convergence follow as corollaries.