

Mean ergodic theorem for polynomial sequences

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Let T be a power bounded Hilbert space operator and let p be a polynomial satisfying $p(\mathbf{N}) \subset \mathbf{N}$. Then the Cesaro sums $N^{-1} \sum_{n=1}^N T^{p(n)}$ converge in the strong operator topology. This generalizes known results for unitary operators and Hilbert space contractions.

The method can be used also for other polynomial-type sequences and for bounded strongly continuous semigroups of operators.