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A multiplicative ergodic theorem for von Neumann algebra valued cocycles

Oseledets' multiplicative ergodic theorem (MET), an important tool in smooth ergodic theory, may be viewed as a dynamical version of the Schur decomposition from linear algebra. Past generalizations of the MET to infinite dimensional spaces have assumed quasi-compactness conditions on the operators. Without assuming any compactness conditions, we use a geometric result of Karlsson-Margulis to obtain an MET with operators in von Neumann algebras with semi-finite trace.