

# Noncommutative maximal ergodic theorems for positive contractions

TURDEBEK N. BEKJAN

*College of Mathematics and System Sciences, Xinjiang University*

*Urumqi, China*

## Abstract

Let  $\mathcal{M}$  be a von Neumann algebra equipped with a normal semifinite faithful trace  $\tau$ . Let  $T$  be a positive linear contraction on  $\mathcal{M}$  such that  $\tau \circ T \leq \tau$  and such that the numerical range of  $T$  as an operator on  $L_2(\mathcal{M})$  is contained in a Stoltz region with vertex 1. I show that Junge and Xu's noncommutative Stein maximal ergodic inequality holds for the powers of  $T$  on  $L_p(\mathcal{M})$ ,  $1 < p \leq \infty$ . I apply this result to obtain the noncommutative analogue of a recent result of Cohen concerning the iterates of the product of a finite number of conditional expectations.