

# Doubly power-bounded operators on $L^p$ , $2 \neq p > 1$

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We show the existence of a doubly power-bounded  $T$  on  $L^p$ ,  $1 < p < \infty$ ,  $p \neq 2$ , such that  $T$  is spectral of scalar type (hence polynomially bounded),  $T$  is not similar to a Lamperti operator (hence is not similar to an isometry), none of the powers of  $T$  is similar to a Lamperti operator, none of the powers is similar to a positive operator, and for some  $f \in L^p$  the averages  $\frac{1}{n} \sum_{k=1}^n T^k f$  (or the averages along the primes or the squares) fail to be a.e. convergent.