ℓ^p-Toeplitz algebra and its application in K-theory

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Let $p > 1$, the ℓ^p Toeplitz algebra is a Banach algebra generated by unilateral shift and its reverse on $\ell^p(\mathbb{N})$. This algebra contains the compact operators on $\ell^p(\mathbb{N})$ as a closed two-sided ideal. In this talk, we show that the quotient by this ideal is isometrically isomorphic to the reduced group ℓ^p operator algebra of the integers. This answers a question of Phillips. As an application, we show that the K-theory of the ℓ^p Toeplitz algebra is independent of p. This result will be useful to prove the controlled Bott periodicity theorem of filtered ℓ^p-operator algebras.