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ESSENTIAL ASCENT AND ESSENTIAL DESCENT OF WEIGHTED COMPOSITION OPERATORS ON l^p SPACES

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Abstract: In this paper we give a complete characterization of essential ascent and essential descent of weighted composition operators on l^p spaces.

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1. Introduction

Let X denote an arbitrary vector space and T be a linear operator on X. Let $D(T)$, $N(T)$ and $R(T)$ denote domain, kernel and range of T respectively. Let $\mathbb{N}$ denote the set of natural numbers. Let $l^p, (1 \leq p < \infty)$ be the Banach space of all p-summable sequences of complex numbers under the standard p-norm on it and let u be a complex-valued function with domain $\mathbb{N}$. For $f \in l^p$ define

$$(uC_\phi)(f)(n) = u(n)f(\phi(n)), \text{ for each } n \in \mathbb{N}.$$

If $(uC_\phi)(f) \in l^p$ whenever $f \in l^p$ then uC_ϕ is a linear transformation on l^p and is called a weighted composition operator on l^p. When u is identically equal to one