IDENTIFYING MULTIPLICATION OPERATORS ON KÖTHE-BOCHNER SPACES

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Let E be a Banach function space on a probability measure space (Ω, Σ, μ). Let X be a Banach space and $E(X)$ be the associated Köthe-Bochner space. An operator on $E(X)$ is called a multiplication operator if it is given by multiplication by a function in $L^{\infty}(\mu)$. In the main result of this talk, we show that an operator T on $E(X)$ is a multiplication operator if and only if T commutes with $L^{\infty}(\mu)$ and leaves invariant the cyclic subspaces generated by the constant vector-valued functions in $E(X)$. As a corollary we show that this is equivalent to T satisfying a functional equation considered by three Spanish mathematicians.

(joint work with Arkady Kitover and Mehmet Orhon)