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A REPRESENTATION OF A POSITIVE LINEAR MAPPING

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Let X and Y be compact Hausdorff spaces. Let $C(X)$ and $C(Y)$ be the algebras of real valued continuous functions on X and Y respectively. $C(X)$ and $C(Y)$ are endowed with their natural partial ordering and their sup norm. Let $\Phi: C(X) \rightarrow C(Y)$ be a positive, bounded linear mapping.

X is said to have the Souslin property if every disjoint family of nonempty open subsets of X is countable.

A lattice L is said to satisfy the countable chain condition upward if the following is true: For any upper bounded subset A of L, there exists a countable subset B of A such that A and B have the same family of upper bounds. The countable chain condition downward on a lattice can be defined in a similar fashion.

A lattice L is said to satisfy the countable chain condition if L satisfies both the countable chain condition upward and the countable chain condition downward.

The purpose of this note is to announce the results on representation for Φ, based on the techniques developed in [**1**], [**2**].

To get the main theorem, we need the following series of propositions which are interesting in themselves.

PROPOSITION. *For a given compact Hausdorff space X, there exists a complete Boolean space X^* and a mapping $\sigma: C(X) \rightarrow C(X^*)$ such that σ is an isometric, order preserving and algebra monomorphism.*

REMARK. The construction of σ here is different from the one in [**3**]. A part of the proof comes from an application of the Gelfand-Naimark theorem [**4**].

We study a necessary and sufficient condition on X under which $C(X^*)$ satisfies the countable chain condition so that we later use this result to represent Φ as the Maharam integral [**2**].

To this end, we introduce the concept of the countable chain condition on a Boolean algebra [**6**] and the pseudocountable chain condition on $C(X)$.

$C(X)$ is said to satisfy the pseudocountable chain condition if every disjoint set of nonzero elements of $C(X)$ is countable. (Two functions f and g of $C(X)$ are disjoint if $\inf(f, g) = 0$.)

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