

# POINTWISE MULTIPLIERS AND THEIR PROPERTIES

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The aim of this dissertation is to describe the space of pointwise multipliers acting between certain classes of Banach lattices and to formulate conditions implying weak compactness of pointwise multiplication operators. The main result of the first part is a complete description of the space of pointwise multipliers between two distinct Orlicz spaces. We thus solve the problem posed by O'Neil in 1965. Moreover, we obtain an equivalent condition for the factorization of two Orlicz spaces. The second chapter is devoted to the generalization of the above result to Musielak-Orlicz and Calderón-Lozanowski spaces. We prove that the space of pointwise multipliers between different Musielak-Orlicz spaces is another space of this class, generated by a generalized complemented function. We also obtain an analogous description in the case of a pair of Calderón-Lozanowski spaces. In the last chapter we study weak compactness in function Banach lattices. The main result of this chapter is the theorem stating that a function Banach lattice  $X$  is 1-disjointly homogeneous if and only if it satisfies the Dunford-Pettis criterion, i.e. the relatively weakly compact sets coincide with the  $X$ -uniformly integrable sets. We also give new examples of a 1-disjointly homogeneous lattices. The obtained results allow us to characterize weakly compact multipliers.

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