

Zhang, Xiao-Dong**On weak compactness in spaces of measures.** (English) Zbl 0874.46030

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It is proved that a weak* compact subset A of scalar measures on a σ -algebra is weakly compact if and only if there exists a nonnegative scalar measure λ such that each measure in A is λ -continuous (such a measure λ is called a control measure for A). This result is then used to obtain a very general form of the Vitali-Hahn-Saks theorem on finitely additive vector measures. Finally, it is proved that a weak* compact subset A of regular Borel measures on an F -space is weakly compact if and only if there exists a nonnegative regular Borel measure λ such that each measure in A is λ -continuous. This latter result shows that Grothendieck's theorem on weak* convergent sequences of measures is valid not only for weak* convergent sequences but also for weak* compact subsets with a control measure.

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MSC:**46G10** Vector-valued measures and integration**46E27** Spaces of measures**28B05** Vector-valued set functions, measures and integrals**46A50** Compactness in topological linear spaces; angelic spaces, etc.Cited in 14 Documents**Keywords:**

weak compactness; subset of scalar measures on a σ -algebra; control measure; Vitali-Hahn-Saks theorem on finitely additive vector measures; regular Borel measure; Grothendieck's theorem on weak* convergent sequences of measures

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