Surjit Singh Khurana
Radon-Nikodym property

Comment.Math.Univ.Carolin. 58,4 (2017) 461 –464.

Abstract: For a Banach space E and a probability space $(X, \mathcal{A}, \lambda)$, a new proof is given that a measure $\mu : \mathcal{A} \to E$, with $\mu \ll \lambda$, has RN derivative with respect to λ iff there is a compact or a weakly compact $C \subset E$ such that $|\mu|_C : \mathcal{A} \to [0, \infty]$ is a finite valued countably additive measure. Here we define $|\mu|_C(A) = \sup\{\sum_k |\langle \mu(A_k), f_k \rangle|\}$ where $\{A_k\}$ is a finite disjoint collection of elements from $\mathcal{A}$, each contained in A, and $\{f_k\} \subset E'$ satisfies $\sup_k |f_k(C)| \leq 1$. Then the result is extended to the case when E is a Frechet space.

Keywords: liftings; lifting topology; weakly compact sets; Radon-Nikodym derivative
AMS Subject Classification: Primary 46B22, 46G05, 46G10, 28A51; Secondary 60B05, 28B05, 28C05

References

[1] Davis W.J., Figiel T., Johnson W.B., Pelczynski A., *Factoring weakly compact operators*, J. Funct. Anal. **17** (1974), 311–327.
[2] Diestel J., Uhl J.J., *Vector Measures*, Amer. Math. Soc. Surveys, 15, American Mathematical Society, Providence, RI, 1977.
[3] Gruenwald M.E., Wheeler R.F., *A strict representation of* $L_1(\mu, X)$, J. Math. Anal. Appl. **155** (1991), 140–155.
[4] Khurana S.S., *Topologies on spaces of continuous vector-valued functions*, Trans Amer. Math. Soc. **241** (1978), 195–211.
[5] Khurana S.S., *Topologies on spaces of continuous vector-valued functions II*, Math. Ann. **234** (1978), 159–166.
[6] Khurana S.S., *Pointwise compactness and measurability*, Pacific J. Math. **83** (1979), 387–391.
[7] Phelps R.R., *Lectures on Choquet's Theorem*, D. van Nostrand Company, Inc., Princeton, N.J.-Toronto, Ont.-London, 1966.
[8] Schaefer H.H., *Topological Vector Spaces*, Springer, 1986.
[9] Ionescu Tulcea A., Ionescu Tulcea C., *Topics in the theory of lifting*, Springer, New York, 1969.