Cesari, L.; Pucci, P.
An elementary proof of an equivalence theorem relevant in the theory of optimization.
(English) [Zbl 0536.46018]

The authors give an elementary proof of an equivalence theorem of analysis which is often used in optimization theory. The theorem asserts that certain conditions are equivalent to weak convergence in $L_1$. One is the Dunford-Pettis condition concerning absolute integrability. Two others are expressed in terms of Nagumo functions, and can be thought of as growth properties. The original proofs of the various parts of the theorem are scattered in different and specialized mathematical publications. The authors feel it useful to present here a straightforward proof of the various parts in terms of standard Lebesgue integration theory.

MSC:

46E30 Spaces of measurable functions ($L^p$-spaces, Orlicz spaces, Köthe function spaces, Lorentz spaces, rearrangement invariant spaces, ideal spaces, etc.)
28A25 Integration with respect to measures and other set functions
46A50 Compactness in topological linear spaces; angelic spaces, etc.
49J27 Existence theories for problems in abstract spaces

Keywords:
equiabsolute integrability; equiabsolute continuity; weak relative compactness in $L_1$; Ascoli's theorem; Lusin's theorem; weak convergence in $L_1$; Dunford-Pettis condition; Nagumo functions; Lebesgue integration

Full Text: DOI

References:


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