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ADDENDUM TO: COMPARISON BETWEEN DIFFERENT TYPES OF ABSTRACT INTEGRALS IN RIESZ SPACES

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In [3] we did not give explicitly the definition of measurability for real-valued functions, with respect to finitely additive measures with values in a Dedekind complete Riesz space. We note that, in [3], all involved functions are intended to be measurable.

We now report the definition of measurability, which we gave in [2] (Definition 3.2).

DEFINITION 0.1. *Let X be any nonempty set, R be a Dedekind complete Riesz space, $\mathcal{A} \subset \mathcal{P}(X)$ be an algebra. Given a non-negative mapping $f : X \to \mathbb{R} \cup \{+\infty\}$ and a finitely additive set function $\mu : \mathcal{A} \to R$, we say that f is measurable with respect to μ (or μ-measurable) if for all $t \geq 0$ the set $\{x \in X : f(x) > t\}$ belongs to $\mathcal{A}$.*

If $f : X \to \mathbb{R}$ is a (non necessarily positive) map, we say that f is measurable if both its positive part f^+ and its negative part f^- are measurable.

In [3], all involved simple functions are intended to be measurable.

In Definition 4.1., we have to introduce an *outer measure*, because otherwise this definition could not make sense. More precisely, proceeding analogously as in [1], Definition 1.3., p. 86, we introduce an outer measure as follows:

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DEFINITION 0.2 *Let X be a nonempty set, $\mathcal{A} \subset \mathcal{P}(X)$ be an algebra, R be a Dedekind complete Riesz space, $\mu : \mathcal{A} \to R$ be a finitely additive set function. We call outer measure associated with μ the R-valued set function $\widetilde{\mu}$, defined on the whole of $\mathcal{P}(X)$ by setting:*

$$(1). \qquad \widetilde{\mu}(A) \equiv \inf\{\mu(B) : A \subset B, B \in \mathcal{A}\} \quad \forall A \in \mathcal{P}(X)$$

So, the definition of (o)-convergence in measure should be formulated as follows:

DEFINITION 0.3 *We say that a sequence $(f_n)_n$ of extended real-valued functions, defined on X, (o)-converges in measure to f if*

$$(o) - \lim_n \widetilde{\mu}(\{x \in X : |f_n(x) - f(x)| > \varepsilon\}) = 0 \quad \forall \varepsilon > 0,$$

and analogously should be formulated the definition of (B)-convergence in measure.

In [3], on page 264, on the lines 5, 10, 13 and on the last line the positive finitely additive set function μ should be replaced by the outer measure $\widetilde{\mu}$ defined in (1).

Thus, when we study the "level sets" of a function, the set function μ have to be replaced by $\widetilde{\mu}$, except in the case in which the involved function are simple: in this case we will take *a priori* simple measurable maps.

In the bibliography of this addendum, in [2] we indicate the exact reference: we are sorry for incorrectness of citation [2] which appeared in the bibliography of [3].

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