Borel measure

Canonical name	BorelMeasure
Date of creation	2013-03-22 17:34:00
Last modified on	2013-03-22 17:34:00
Owner	asteroid (17536)
Last modified by	asteroid (17536)
Numerical id	24
Author	asteroid (17536)
Entry type	Definition
Classification	msc 60A10
Classification	msc 28C15
Classification	msc 28A12
Classification	msc 28A10
Related topic	BorelSigmaAlgebra
Related topic	RadonMeasure
Related topic	BorelSpace
Related topic	Measure
Related topic	MeasurableSpace
Related topic	BorelGroupoid
Related topic	BorelMorphism
Related topic	BorelGSpace

Definition 1 - Let X be a topological space and $\mathcal{B}$ be its http://planetmath.org/BorelSigmaA σ-algebra. A **Borel measure** on X is a measure on the measurable space $(X, \mathcal{B})$.

In the literature one can find other different definitions of Borel measure, like the following:

Definition 2 - Let X be a topological space and $\mathcal{B}$ be its Borel σ-algebra. A **Borel measure** on X is a measure μ on the measurable space $(X, \mathcal{B})$ such that $\mu(K) < \infty$ for all compact subsets $K \subset X$. (ref.[**?**]).

Definition 3 - Let X be a topological space and $\mathcal{B}$ be the σ-algebra generated by all compact sets of X. A **Borel measure** on X is a measure μ on the measurable space $(X, \mathcal{B})$ such that $\mu(K) < \infty$ for all compact subsets $K \subset X$.

Definition 4 - The http://planetmath.org/RestrictionOfAFunctionrestriction of the Lebesgue measure to the Borel σ-algebra of $\mathbb{R}^n$ is also sometimes called "the" Borel measure of $\mathbb{R}^n$.

Remark - Definitions 2 and 3 are technically different. For example, when constructing a Haar measure on a locally compact group one considers the σ-algebra generated by all compact subsets, instead of all closed (or open) sets.

References

[1] M.R. Buneci. 2006., http://www.utgjiu.ro/math/mbuneci/preprint/p0024.pdfGroupoid C*-Algebras., *Surveys in Mathematics and its Applications*, Volume 1: 71–98.

[2] A. Connes.1979. Sur la théorie noncommutative de l' integration, *Lecture Notes in Math.*, Springer-Verlag, Berlin, **725**: 19-14.