

Rodríguez, José

Weak Baire measurability of the balls in a Banach space. (English) Zbl 1147.46016
Stud. Math. 185, No. 2, 169-176 (2008).

Author's abstract: Let X be a Banach space. The property (\star) "the unit ball of X belongs to $\text{Baire}(X, \text{weak})$ " holds whenever the unit ball of X^* is weak*-separable; on the other hand, it is also known that the validity of (\star) ensures that X^* is weak*-separable. In this paper, we use suitable renormings of $\ell^\infty(\mathbb{N})$ and the Johnson–Lindenstrauss spaces to show that (\star) lies strictly between the weak*-separability of X^* and that of its unit ball. As an application, we provide a negative answer to a question raised by *K. Musiał* [*Rend. Ist. Mat. Univ. Trieste* 23, 177–262 (1991; [Zbl 0798.46042](#))].

Reviewer: [Hans Weber \(Udine\)](#)

MSC:

[46B26](#) Nonseparable Banach spaces

[28A05](#) Classes of sets (Borel fields, σ -rings, etc.), measurable sets, Suslin sets, analytic sets

[28B05](#) Vector-valued set functions, measures and integrals

[46G10](#) Vector-valued measures and integration

Cited in **6** Documents

Keywords:

Banach space; weak*-separability; Baire σ -algebra; scalar measurability; Pettis integral

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