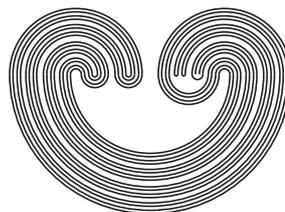


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## AN EXTENSION OF THE BAIRE PROPERTY

by

CHRISTOPHER CARUVANA AND ROBERT R. KALLMAN

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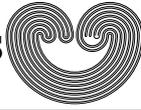
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## AN EXTENSION OF THE BAIRE PROPERTY

CHRISTOPHER CARUVANA AND ROBERT R. KALLMAN

**ABSTRACT.** The purpose of this paper is to define for every Polish space  $X$  a class of sets, the  $EBP(X)$ -sets or the extended Baire property sets, to work out many properties of the  $EBP(X)$ -sets and to show their usefulness in analysis. For example, a proper generalization of the Pettis Theorem is proved in this context that furnishes a new automatic continuity result for Polish groups. The name extended Baire property sets is reasonable since  $EBP(X)$  contains the Baire property sets  $BP(X)$  and it is consistent with ZFC that the containment is proper.

### 1. INTRODUCTION

The purpose of this paper is to define for every Polish space  $X$  a class of sets, the  $EBP(X)$  sets or the extended Baire property sets, to work out many properties of the  $EBP(X)$  sets and to show their usefulness in analysis. For example, a proper generalization of the Pettis Theorem is proved in this context that furnishes a new automatic continuity result for Polish groups. The name extended Baire property sets is reasonable since  $EBP(X)$  contains the Baire property sets  $BP(X)$  and it is consistent with ZFC that the containment is proper.

Recall some basic facts about the topology on the space of probability measures on a Polish space  $X$ . Let  $\mathcal{M}(X)$  be the collection of all Borel probability measures on  $X$  and let  $C_b(X)$  be the collection of all functions  $f : X \rightarrow \mathbb{R}$  which are continuous and bounded. Endow  $\mathcal{M}(X)$  with the coarsest topology for which each map

$$\mu \mapsto \int f d\mu, \mathcal{M}(X) \rightarrow \mathbb{R},$$

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