
TOPOLOGY PROCEEDINGS



Volume 44, 2014

Pages 59–74

<http://topology.auburn.edu/tp/>

PROBABILISTIC LIMIT GROUPS UNDER A T-NORM

by

G. JÄGER AND T. M. G. AHSANULLAH

Electronically published on June 3, 2013

This file contains only the first page of the paper. The full version of the paper is available to Topology Proceedings subscribers.

See <http://topology.auburn.edu/tp/subscriptioninfo.html> for information.

Topology Proceedings

Web: <http://topology.auburn.edu/tp/>

Mail: Topology Proceedings
Department of Mathematics & Statistics
Auburn University, Alabama 36849, USA

E-mail: topolog@auburn.edu

ISSN: 0146-4124

COPYRIGHT © by Topology Proceedings. All rights reserved.

PROBABILISTIC LIMIT GROUPS UNDER A T-NORM

G. JÄGER AND T. M. G. AHSANULLAH

ABSTRACT. We introduce probabilistic limit groups under a t-norm and study their basic properties. We show that for the classes of strict t-norms, all categories of probabilistic limit groups under such t-norms are isomorphic. The same is true for nilpotent t-norms. We further show that for each probabilistic limit group under a t-norm there is a natural probabilistic uniform limit structure which has the same underlying probabilistic Cauchy structure as the probabilistic limit group.

1. INTRODUCTION

Probabilistic limit spaces were introduced by Liviu C. Florescu [4]. He used net convergence to describe such spaces. A formulation in terms of filter convergence was given by G. D. Richardson and D. C. Kent [16]. Probabilistic convergence spaces extend the theory of probabilistic metric spaces (see [12] and [17]) and probabilistic topological spaces (see [5]) by assigning to a filter a probability to converge to a point. This was subsequently generalized by Harald Nusser [14], who used t-norms in various axiom systems of probabilistic spaces.

This paper looks at a special class of probabilistic limit spaces, where the underlying set additionally carries a group structure. The compatibility of the group operations with the convergence structure is usually expressed by continuity of the group operations. However, in some applications (for example, when looking at normed vector spaces), this compatibility—in the probabilistic case—has to be defined differently. We give a suitable definition and study the resulting category of probabilistic

2010 *Mathematics Subject Classification.* Primary 54A05, 54A20, 54E15.

Key words and phrases. limit group, limit tower group, probabilistic Cauchy space, probabilistic limit group, probabilistic uniformization, probabilistic uniform limit space, t-norm.

©2013 Topology Proceedings.

This file contains only the first page of the paper. The full version of the paper is available to Topology Proceedings subscribers. See <http://topology.auburn.edu/tp/subscriptioninfo.html> for information.