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Rejoinder

# Why fuzzy $\mathcal{T}$ -equivalence relations do not resolve the Poincaré paradox, and related issues

Martine De Cock\*, Etienne Kerre

*Department of Applied Mathematics and Computer Science, Ghent University, Krijgslaan 291 (S9),  
B-9000 Gent, Belgium*

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## Abstract

In this paper, which is a rejoinder on the comments (Fuzzy Sets and Systems, 133 (2) (2003)), we will answer the questions whether approximate equality should satisfy transitivity, and whether fuzzy  $\mathcal{T}$ -equivalence relations resolve the Poincaré paradox. Furthermore, we will present an improved definition of resemblance relation and we will investigate its connection with nearness relations. © 2002 Elsevier Science B.V. All rights reserved.

*Keywords:* Approximate equality; Poincaré paradox; Fuzzy  $\mathcal{T}$ -equivalence relation; Resemblance relation; Nearness relation

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## 1. Introduction

Taking into account the comments [1, 2, 13, 16], in this rejoinder we will answer the questions whether approximate equality should satisfy transitivity and whether fuzzy  $\mathcal{T}$ -equivalence relations resolve the Poincaré paradox. Furthermore, we will present a simplified definition of the concept of a resemblance relation. We will explain to the reader why we have taken an interest in modelling approximate equality in the first place, and which were to us the first signs that fuzzy  $\mathcal{T}$ -equivalence relations would not be suitable to do the job, forcing us to look for another kind of fuzzy relation. In this respect we want to stress that it was certainly never our intention to encourage the reader to dismiss fuzzy  $\mathcal{T}$ -equivalence relations at all, but rather to point out that these otherwise nice mathematical entities are not suitable to model approximate equality.

First of all, however, we will explain as clearly as possible what approximate equality is from the semantical point of view, since this is an important prerequisite for the further discussion as is pointed out rightly in [1, 2, 16].

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\* Corresponding author. Tel.: +32-9-264-4772; fax: +32-9-264-4995.

*E-mail addresses:* martine.decock@rug.ac.be (M. De Cock), etienne.kerre@rug.ac.be (E. Kerre).

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