Accepted Manuscript

Classification of simple linearly compact Kantor triple systems over the complex numbers

Nicoletta Cantarini, Antonio Ricciardo, Andrea Santi

PII: S0021-8693(18)30483-6
DOI: https://doi.org/10.1016/j.jalgebra.2018.08.009
Reference: YJABR 16823

To appear in: *Journal of Algebra*

Received date: 18 December 2017

Please cite this article in press as: N. Cantarini et al., Classification of simple linearly compact Kantor triple systems over the complex numbers, *J. Algebra* (2018), https://doi.org/10.1016/j.jalgebra.2018.08.009

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

CLASSIFICATION OF SIMPLE LINEARLY COMPACT KANTOR TRIPLE SYSTEMS OVER THE COMPLEX NUMBERS

NICOLETTA CANTARINI, ANTONIO RICCIARDO, AND ANDREA SANTI

Abstract. Simple finite-dimensional Kantor triple systems over the complex numbers are classified in terms of Satake diagrams. We prove that every simple and linearly compact Kantor triple system has finite dimension and give an explicit presentation of all the classical and exceptional systems.

Contents

1. Introduction 1
2. Triple systems and the Tits-Kantor-Koecher construction 4
2.1. Basic definitions and results 4
2.2. The Tits-Kantor-Koecher construction revisited 5
2.3. Simplicity in the Tits-Kantor-Koecher construction 8
3. Finite dimensional Kantor triple systems 11
3.1. Preliminaries on real and complex $\mathbb{Z}$-graded Lie algebras 11
3.2. Grade-reversing involutions and aligned pairs 11
3.3. Classification of finite dimensional Kantor triple systems 13
3.4. The algebra of derivations 17
4. Classical Kantor triple systems 18
4.1. Main examples 18
4.2. The classification of classical Kantor triple systems 20
5. The exceptional Kantor triple systems of extended Poincaré type 21
5.1. The case $\mathfrak{g} = \mathsf{F}_4$ 22
5.2. The case $\mathfrak{g} = \mathsf{E}_6$ 25
5.3. The case $\mathfrak{g} = \mathsf{E}_7$ 27
5.4. The case $\mathfrak{g} = \mathsf{E}_8$ 29
6. The exceptional Kantor triple systems of contact type 30
6.1. The case $\mathfrak{g} = \mathsf{G}_2$ 30
6.2. The case $\mathfrak{g} = \mathsf{F}_4$ 31
6.3. The case $\mathfrak{g} = \mathsf{E}_6$ 32
6.4. The case $\mathfrak{g} = \mathsf{E}_7$ 34
6.5. The case $\mathfrak{g} = \mathsf{E}_8$ 37
7. The exceptional Kantor triple systems of special type 42
7.1. The case $\mathfrak{g} = \mathsf{E}_6$ 42
7.2. The case $\mathfrak{g} = \mathsf{E}_7$ 43
Acknowledgments 44
References 44

1. Introduction

Let $(A, \cdot)$ be an associative algebra. Then the commutative product

$$a \circ b = \frac{1}{2}(a \cdot b + b \cdot a)$$

Download English Version:

https://daneshyari.com/en/article/10130497

Download Persian Version:

https://daneshyari.com/article/10130497

Daneshyari.com