ON THE CLASSIFICATION OF KANTOR TRIPLE SYSTEMS

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Let $\mathfrak{g}$ be a 5-graded Lie algebra, with grading $\mathfrak{g} = \bigoplus_{-2}^{2} \mathfrak{g}_i$, and σ a grade-reversing involution of $\mathfrak{g}$, i.e. $\sigma(\mathfrak{g}_i) = \mathfrak{g}_{-i}$. The space $\mathfrak{g}_{-1}$ with triple product $(x, y, z) = [[x, \sigma(y)], z]$ is then a Kantor triple system, also known as generalized Jordan triple system of 2-nd kind. The Tits-Kantor-Koecher construction gives a bijection between simple Kantor triple systems and simple 5-graded Lie algebras with a grade-reversing involution. Simple finite-dimensional Kantor triple systems are classified in terms of Satake diagrams. Moreover, every simple linearly compact Kantor triple system is finite-dimensional and an explicit presentation of all the classical and exceptional systems can be obtained in this way. This is a joint work with Nicoletta Cantarini[1] and Andrea Santi[1] ([1]). Important contribution to the subject, among others, have also appeared in [2], [3].

In this talk I will describe the classification of simple Kantor triple systems obtained in [1] with a focus on the role played by Satake diagrams, I will show how simple classical Kantor triple systems arise from associative algebras. Also examples of exceptional Kantor triple systems will be described.

REFERENCES:

1 Nicoletta Cantarini, Antonio Ricciardo, Andrea Santi. *Classification of simple Kantor triple systems*. pre-print. URL: `https://arxiv.org/abs/1710.05375`, 2017.

2 Soji Kaneyuki, Hiroshi Asano. *Graded Lie algebras and generalized Jordan triple systems*. Nagoya Math. J., 112:81–115, 1988.

3 Daniel Mondoc. *Compact Exceptional Simple Kantor Triple Systems Defined on Tensor Products of Composition Algebras*. Communications in Algebra 35.11:3699-3712, 2007.