

REPORT:

The paper "The algebraic and geometric classification of Jordan superalgebras" is a groundbreaking work that delves deeply into the study of four-dimensional complex Jordan superalgebras. The authors brilliantly combine algebraic and geometric approaches to classification, making this contribution not only significant but also methodologically valuable for future research in this area.

One of the paper's strongest aspects is its well-structured presentation. The introduction justifies the relevance of the topic by highlighting the connections between Jordan superalgebras, physics (supersymmetry of elementary particles), and Lie theory. This historical and theoretical context underscores the interdisciplinary nature of the research and its importance for both algebraists and experts in related scientific fields.

The level of detail in the results deserves special mention. The paper presents three key theorems, each addressing different types of Jordan superalgebras (1,3), (2,2), and (3,1). These theorems are accompanied by precise calculations of dimensions, descriptions of rigid superalgebras, and irreducible components. Every claim is not only rigorously justified but also visually supported by tables, which greatly enhance the accessibility of complex material.

The methods employed in the study demonstrate the authors' deep understanding of the subject. They rely on rigorous applications of degeneration theory, orbit structure, and rigidity in superalgebras. Notably, the proofs incorporate both classical approaches (e.g., Burde invariants) and modern techniques for analyzing superidentities. This dual approach makes the paper particularly valuable for readers interested not only in the results but also in the tools needed for independent research.

Furthermore, the paper excels in clarity of exposition. Despite the high mathematical complexity, the authors avoid overloading the text with technical details while maintaining strict rigor. This balance between accessibility and scientific precision is a rare achievement.

I firmly believe that the paper "The algebraic and geometric classification of Jordan superalgebras" merits publication in SEMR. Its contribution to the classification of Jordan superalgebras is invaluable, and it will undoubtedly capture the interest of a broad audience of specialists.

- Could you provide some information on the field \mathbb{F} ? [in proofs of Theorems 11,12,13, etc.] Is it the complex field as it was stated in the abstract?
- I suggest combining [Subsection 1.1. and Section 2] into one Section; [Subsections 1.2-4., and Section 3] into another one Section.
- I suggest using numbers to indicate the dimensions of orbits in Th. 8 and 9.
- You have to include information about the considered field in Th. 13, 14, 15.
- Use the same notation for O and \mathcal{O} .
- It will be better to rewrite the *non-degenerations reasons* in a more compact way, i.e. instead $A - B = 0$ write $A = B$, etc.

Page	Line	Typo	Correction
1	24	Mail goal	Main goal
1	-3	2002	2001
2	13	One one-parametric families	One one-parametric family
3	Def 4	derivation	superderivation
4	19	Polinomial	Polynomial
4	-13	Lie algebra	Lie superalgebra
4	-13	derivation	superderivation
8	-5	Obtian	Obtain
37	ref[18]	Oveimar Quintero Vanegas E.	Quintero Vanegas, E. O.
37	ref[29]	Lopez-Diaz	López-Díaz
37	ref[33]	Martinez C.	Racine, M. L.