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# On Recent Conjectures Concerning Free Jordan Algebras and Free Alternative Algebras

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In 2019, Iryna Kashuba and Olivier Mathieu proposed a beautiful conjecture on Lie algebra homology which, if true, would supply a lot of new information on the structure of free Jordan algebras, one of most mysterious algebraic structures systematically appearing in different areas of mathematics and mathe matical physics. Their construction relies on a functorial version of the celebrated Tits-Kantor-Koecher construction. Motivated by their work, Shang proposed an analogue of this conjecture, which would in turn supply new information on the structure of free alternative algebras. In this talk, I shall explain why both of these conjectures are not true, discuss new computational data concerning free Jordan algebras, and, time permitting, outline some related open problems.
This is partially based on joint work with Irvin Hentzel.

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