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Peter D. Goetz* (peter.goetz@humboldt.edu). *The Koszul property for graded twisted tensor products*. Preliminary report.

An algebra C is called a twisted tensor product of algebras A and B if there are injections $A \rightarrow C$ and $B \rightarrow C$ such that the induced canonical map $A \otimes B$ to C is a vector space isomorphism. In joint work with A. Conner, we found necessary and sufficient conditions for when C is a quadratic algebra, given that A and B are quadratic. In that work we also constructed Koszul algebras A and B and a twisted tensor product C that is not Koszul. However, for these examples, C was not quadratic. Recently, A. Conner found examples in which A and B are Koszul, and C is quadratic, but not Koszul. In this talk I will introduce these examples, and discuss our attempts to understand them. Intriguingly, there may be some relationship to the characterization of Koszul algebras in terms of distributive lattices of vector spaces. (Received February 06, 2018)