Słupecki digraphs

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Call a relational structure Słupecki if its surjective polymorphisms are all essentially unary. It is clear that if a structure has this property, then its idempotent polymorphisms are projections, i.e. it is idempotent-trivial. We say that a relational structure is 2-idempotent-trivial if its binary idempotent polymorphisms are projections. In a 1991 paper, Benoit Larose showed that if a finite poset having at least three elements is 2-idempotent-trivial, then it is idempotent-trivial. One natural question is whether some analogue of this result holds for Słupeckiness. We answer this question in the negative. In this talk, after some review of previous results on Słupecki digraphs, we show our counterexamples and some open problems.

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[1] Joint work with Benoit Larose and David Emmanuel Pazmiño