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## Kontsevich graph $\gamma_3$ -flow of Nambu-Poisson brackets: triviality established in 2D, 3D, and now, in 4D

Kontsevich constructed a map from suitable cocycles in the graph complex to infinitesimal deformations of Poisson bivectors. Are such deformations trivial, meaning, do they amount to a change of coordinates along a vector field? We examine this question for Nambu-Poisson brackets deformed by the tetrahedron  $\gamma_3$ , the smallest nontrivial graph cocycle in the Kontsevich graph complex.

We use Kontsevich's graph calculus, in which directed graphs encode differential formulas on  $\mathbb{R}^d$ . In particular, we use dimension-specific micro-graphs, in which each vertex represents an element of the Nambu-Poisson bracket.

The (non)trivialisation problem gives us a sequence of overdetermined inhomogeneous linear algebraic systems on the coefficients of micro-graphs over  $\mathbb{R}^d$ , for  $d \ge 2$ . We use the SageMath package gcaops for computations. For a chosen good graph, namely the tetrahedron  $\gamma_3$ , Kontsevich knew that the linear system is solvable for d = 2 (1996). In 2020, Buring and Kiselev proved that the linear system is solvable for d = 3. Building on these discoveries, we now establish that for the  $\gamma_3$ -flow, the linear system is solvable for d = 4.

Primary authors: JAGOE BROWN, Mollie Susan; KISELEV, Arthemy (University of Groningen)

Presenter: JAGOE BROWN, Mollie Susan

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