MP 7: Integrable Strukturen

Time: Wednesday 10:35–10:55 Location: HFT-FT 101

MP 7.1 Wed 10:35 HFT-FT 101

Simplex and polygon equations — •Folkert Müller-Hoissen[1] and Aristophanes Dimakis[2] — [1]Max-Planck-Institut für Dynamik und Selbstorganisation, Göttingen — [2]Department of Financial and Management Engineering, University of the Aegean, 82100 Chios, Greece

Simplex equations extend the (quantum) Yang-Baxter equation to an infinite sequence of equations, where neighboring equations are related by a kind of integrability condition. The underlying structure is encoded in the higher Bruhat orders, originally introduced by Manin and Schechtman in 1986. The latter admit a decomposition into a higher Tamari order, the corresponding dual Tamari order, and a "mixed order". In the same way as the simplex equations correspond to higher Bruhat orders, there is a family of "polygon equations" realizing higher Tamari orders. They extend the well-known pentagon equation to an infinite sequence of equations, which we call polygon equations. The structure of simplex and polygon equations can be visualized in terms of deformations of maximal chains in posets forming 1-skeletons of polyhedra. The decomposition of higher Bruhat orders induces a reduction of the N-simplex equation to the $(N+1)$-gon equation, its dual, and a compatibility equation.