

## Classification of the Ultra-Discrete QRT System

Takuji Sakamoto

*Institute of physics, University of Tokyo, Komaba 3-8-1, Meguro-ku,  
Tokyo 153-8902, Japan*

An 8-parametar family of 2-dimensional piecewise linear mappings, the ultra-discrete QRT (u-QRT) system, is obtained from the QRT (Quispel-Roberts-Thompson) system through elimination of parameters and ultra-discretization. The u-QRT system has an 8-parameter family of invariant curves, and the mappings of the u-QRT system are reversible. Therefore the u-QRT system is considered to be integrable. We classify the u-QRT system into four types by the extended Newton polytopes constructed from the conserved quantities through inverse-tropicalization (in Tropical Geometry). Moreover we conjecture on the explicit formula of the period.