8th International Conference on Symmetries and Integrability of Difference Equations (SIDE8) **June 22–28, 2008**
8e *Conférence internationale "Symétrie et intégrabilité des équations aux différences"* (SIDE8) **22–28 juin, 2008**

Geometry of tropical QRT integrable maps

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Abstract

The tropical QRT (tQRT) (also known as piecewise-linear or ultra-discrete) 8-parameter family of integrable mappings in the plane were first obtained by ultradiscretization from a subtraction-free family of QRT maps. The tropical versions of the aforementioned maps inherit the properties of being reversible and area-preserving, having an integral whose level sets foliate the plane, as well as possessing a group of symmetries. However, since ultradiscrete curves are convex polygons or fans, the tQRT mappings present an interesting geometry on their own. In this talk we will show all possible patterns that occur for non-compact level sets of the tQRT maps as well as the bifurcation analysis for a family of symmetric tQRT maps.

This is joint work with I. Saputra and G.R.W. Quispel.