

Recursive formulas for Welschinger invariants of real Del Pezzo surfaces

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Abstract

The Welschinger invariants are designed to bound from below the number of real rational curves passing through a given generic real collection of points on a real rational surface. In some cases these invariants can be calculated using Mikhalkin's approach which deals with a corresponding count of tropical curves. Tropical curves are piecewise-linear objects which can be seen as algebraic curves over the tropical semifield.

As is known, in certain situations (for example, in the case of generic collections of real points on a toric Del Pezzo surface equipped with the tautological real structure) there is a logarithmic equivalence between the Welschinger and Gromov-Witten invariants. We consider generic collections of real points on the projective plane blown up at 4 points in general position and, using appropriate tropical Caporasso-Harris type formulas, prove that the logarithmic equivalence of the Welschinger and Gromov-Witten invariants holds in this situation as well. The proof is based on a new version of the correspondence theorem.

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