

Oriented edge-transitive maps

Ján Karabáš

University of Primorska, Koper and Matej Bel University, Banská Bystrica
karabas@savbb.sk

Roman Nedela

Matej Bel University, Banská Bystrica
nedela@savbb.sk

Tomaž Pisanski

University of Primorska, Koper
Tomaz.Pisanski@fmf.uni-lj.si

An oriented map M is edge-transitive if its group of automorphisms, $\text{Aut } M$, acts transitively on the edges of the underlying graph of M . The group of orientation-preserving automorphisms, $\text{Aut}^+ M$, of index at most two of $\text{Aut } M$. It follows that the quotient map of an edge-transitive map, $\bar{M} = M \setminus \text{Aut}^+ M$, is a map on an (quotient) orbifold with at most two edges. We show that there are exactly 8 such quotient maps sitting on orbifolds with at most 4 singular points, seven are spherical and one is toroidal.

The (general) classification of edge-transitive maps is well-known, due to results of Graver and Watkins (1997), Širáň, Tucker and Watkins (1999) and recently by Orbanić, Pellicer, Pisanski and Tucker (2011). The general approach is computationally difficult. The complete classification ranges to the genus 4 (in oriented case, Orbanić et al.) Compared to that method we control the genus g of the underlying surface by choosing a proper g -admissible orbifold rather than number of edges. Thanks to the classification of ‘large groups of automorphisms’ (Conder, 2011) we are able to classify oriented edge-transitive maps up to genus 101.

We discuss the relationships among general classification of edge-transitive maps and the classification of oriented edge-transitive maps. We also consider the possibilities to extend the classification of *oriented* edge-transitive maps to general situation.