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Combinatorial patchworking of real pseudo-holomorphic curves



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Abstract: The Viro method of construction of real algebraic varieties with prescribed topology uses convex subdivisions of Newton polyhedra. We show that in the case of arbitrary (not necessarily convex) subdivisions of polygons corresponding to $\mathbb{C}P^2$ and rational ruled surfaces Σ_a , $a \geq 0$ the Viro method produces pseudo-holomorphic curves. The version of the Viro method discussed in the paper also gives a possibility to construct singular pseudo-holomorphic curves by gluing singular algebraic curves whose collections of singularities do not permit to glue these curves in the framework of the standard Viro method. As an application, we construct a series of singular real pseudo-holomorphic curves in $\mathbb{C}P^2$ whose collections of singular points do not occur on known algebraic curves of the same degree.

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