

On star regular equidistant polyhedrons in Lobachevsky space

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We have shown previously some examples when finite regular lens polytopes can be obtained from infinite equidistant regular polytopes in Lobachevski spaces [2], and that these regular lens polytopes can be used to obtain new three-dimensional hyperbolic manifolds [3, 4]. On the other hand, we have shown in [5] that a regular lens polytope of type $\{2m+1, 3\}$ can always be "stellate", using the Coxeter terminology [1], yielding infinite regular star equidistant polytopes with convex 2-faces and stellar vertices (we obtain also the dual star equidistant regular polytopes with stellar faces and convex honohedra). Obviously, using factorization of a base, the star regular lenses can be transformed into regular finite star lens polytopes, analogously as for usual convex regular infinite star lenses. We will discuss one of the most simple and interesting cases: the Klein surface of genus 3 with the regular map $\{7, 3\}$.

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