

Rigidity of compact Fuchsian manifolds with convex boundary

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It is known that convex bodies in the Euclidean 3-space are globally rigid, i.e., their shape is determined by the intrinsic geometry of the boundary. This story was developed separately in smooth and in polyhedral settings until in 50s it was unified by Pogorelov who proved the rigidity of general convex bodies without any assumptions on their boundaries except convexity. Later another approach was proposed by Volkov with the help of polyhedral approximation.

On the other hand, in 70s Thurston revolutionized the field of 3-dimensional topology by formulating his geometrization program culminated in the famous works of Perelman. In particular Thurston highlighted the abundance and the ubiquity of hyperbolic 3-manifolds. In the scope of this framework some amount of attention was directed towards hyperbolic 3-manifolds with convex boundary. It is conjectured that their shape is determined by the topology and the intrinsic geometry of the boundary. So far this was established only for smooth strictly convex boundaries by Schlenker.

In my recent work I obtained the general rigidity for a toy family of hyperbolic 3-manifolds with convex boundary. This was achieved by reviving the approach of Volkov.