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Curvature Properties of Planar Harmonic Mappings

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Abstract. A geometric interpretation of the Schwarzian of a harmonic mapping is given in terms of geodesic curvature on the associated minimal surface, generalizing a classical formula for analytic functions. A formula for curvature of image arcs under harmonic mappings is applied to derive a known result on concavity of the boundary. It is also used to characterize fully convex mappings, which are related to fully starlike mappings through a harmonic analogue of Alexander's theorem.

Keywords. Harmonic mapping, Schwarzian derivative, geodesic curvature, minimal surface, convex, starlike.

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