The geometry of planar *p*-harmonic mappings: convexity, level curves and the isoperimetric inequality

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Abstract. We discuss various representations of planar *p*-harmonic systems of equations and their solutions. For coordinate functions of *p*-harmonic maps we analyze signs of their Hessians, the Gauss curvature of *p*-harmonic surfaces, the length of level curves as well as we discuss curves of steepest descent. The isoperimetric inequality for the level curves of coordinate functions of planar *p*-harmonic maps is proven. Our main techniques involve relations between quasiregular maps and planar PDEs. We generalize some results due to P. Lindqvist, G. Alessandrini, G. Talenti and P. Laurence.