

Prescribing the curvature of Riemannian manifolds with boundary

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Abstract. Let M be a compact connected surface with boundary. We prove that the sign condition given by the Gauss-Bonnet theorem is necessary and sufficient for a given smooth function f on ∂M (resp. on M) to be geodesic curvature of the boundary (resp. the Gauss curvature) of some flat metric on M (resp. metric on M with geodesic boundary). For $n \geq 3$, we prove some topological restrictions which imply, among other things, that any function that is negative somewhere on ∂M (resp. on M) is a mean curvature of a scalar flat metric on M (resp. scalar curvature of a metric on M and minimal boundary with respect to this metric). As an application of our results, we obtain a classification theorem for manifolds with boundary.