## Optimality conditions for mass design problems and applications to thin plates

G. Bouchitté and I. Fragalà

**Abstract**. We derive necessary and sufficient optimality conditions for a quite large class of structural design problems which can be roughly formulated as follows: under a given load and a total volume constraint, minimize a suitable notion of compliance among all admissible mass distributions, represented by positive measures with prescribed integral mean. As a special case, we focus attention on the optimization of thin plates; we detail the corresponding optimality conditions and we show how they can be handled in order to determine analytically some optimal plates.