The optimal compliance problem for thin elastic plates

We consider the variational problem which consists in minimizing the compliance of a prescribed amount of elastic material, placed into a given design region, and submitted to an exterior balanced load.

We discuss the asymptotic analysis of this problem when the design region is a cylinder of infinitesimal height. It turns out that, in the limit, optimal material distributions exist under the form of classical solutions, namely they are represented by a characteristic function. Moreover, the less compliant plates can be determined via explicit optimality conditions, and they turn out to be sandwich-shaped.

The results are contained in some recent papers in collaboration with Guy Bouchitté and Pierre Seppecher.