

OPTIMAL TOPOLOGY DESIGN OF BEAM CROSS-SECTION BY APPLYING TOPOLOGICAL DERIVATIVE CONCEPT

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Abstract. This work addresses the problem of optimal topological design of beam cross-section based on the use of topological derivatives. The elastic axial, flexural, and torsional rigidities are defined as a cost functional. The geometric and material representation is accomplished using level-set curves. To minimize a cost function, the topological derivative value is used to guide the evolution of the level-set curve. A theoretical framework and case studies of academic and industrial applications are presented.