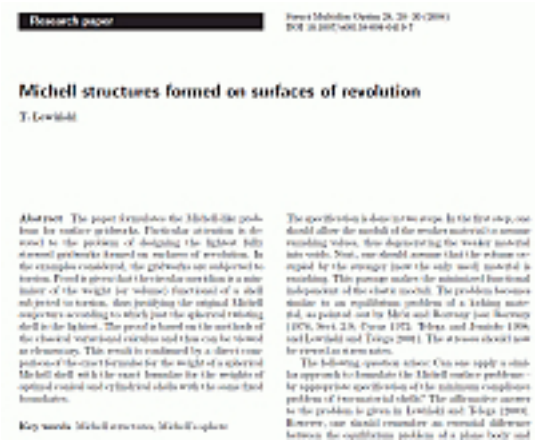
Research paper

Michell structures formed on surfaces of revolution

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The paper formulates the Michell-like problems for surface gridworks. Particular attention is devoted to the problem of designing the lightest fully stressed gridworks formed on surfaces of revolution. In the examples considered, the gridworks are subjected to torsion. Proof is given that the circular meridian is a minimizer of the weight (or volume) functional of a shell subjected to torsion, thus justifying the original Michell conjecture according to which just the spherical twisting shell is the lightest. The proof is based on the methods of the classical variational calculus and thus can be viewed as elementary. This result is confirmed by a direct comparison of the exact formulae for the weight of a spherical Michell shell with the exact formulae for the weights of optimal conical and cylindrical shells with the same fixed boundaries.