On a Unified Geometric Framework for Thin Translation Shells as Optimal Surfaces

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Abstract This article aims at a natural unified framework for thin elastic shells with respect to both the ongoing practice and the often rhapsodic, aesthetic imagination in the field of architecture. In doing so, we shall present very elementary modifications to the existing mechanical theory of thin elastic shells, while still sufficiently lending new mathematical insight to practical imagination. Owing to the introductory nature of this exposition, further theoretical developments in this direction shall be readily manifest elsewhere. The resulting elementary framework, however, is one which seeks to epistemically overcome the rather stringent disparities between purely mechanical, geometric, and aesthetic phenomena (when considered in themselves), especially when it comes to their respective analytical treatment.

Keywords geometry, mechanics, aesthetics, unification, thin translation shells, domes

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