Abstract
The theory of archgrids of minimal weight has been formulated in the late 1970s and recently reconsidered by means of duality theory in the calculus of variations. In the current study, we follow this approach by putting forward an efficient computational scheme. Trial functions for both primal and dual problems are decomposed in two function bases: trigonometric (Fourier) and polynomial (Legendre). Our focus is on structures composed of arches forming a rectangular grid, i.e. running in two mutually perpendicular directions and spanning a given rectangular domain. In the course of discussion, we show that the numerical algorithm is quickly convergent, CPU time efficient, and robust. In particular, it provides clear-cut solutions in which optimal parts of a structure are sharply distinguished from the non-optimal, hence redundant, ones.