
RESEARCH PAPER

On the solution of the three forces problem and its application in optimal designing of a class of symmetric plane frameworks of least weight

On the solution of the three forces problem and its application in optimal designing of a class of symmetric plane frameworks of least weight, Tomasz Sokół , Tomasz Lewiński

Structural and Multidisciplinary Optimization, *2010, Vol. 42, Issue 6 , pp 835-853,* Read online>>

Two problems of minimum weight design of plane trusses are dealt with. The first problem concerns construction of the lightest fully stressed truss subject to three self-equilibrated forces applied at three given points. This problem has been solved analytically by H.S.Y. Chan in 1966. This analytical solution is re-derived in the present paper. It compares favourably with new numerical solutions found here by the method developed recently by the first author. The solution to the three forces problem paves the way to half-analytical as well as numerical solutions to
the problem of minimum weight design of plane symmetric frameworks transmitting two symmetrically located vertical forces to two fixed supports lying along the line linking the points of application of the forces.