國立中山大學應用數學系
學術演講

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講　題：STATIC ANALYSIS OF THE FREE-FREE TRUSSES BY USING A SELF-REGULARIZATION APPROACH

時　間：2019/11/14（Thursday）16:10 ~ 17:00

地　點：理學院四樓理 SC 4009-1 室

茶　會：15:30 於理 SC 4010 室 (系辦公室)

Abstract

Following the success of static analysis of free-free 2-D plane trusses by using a self-regularization approach uniquely, we further extend the technique to deal with 3-D problems of space trusses. The inherent singular stiffness of a free-free structure is expanded to a bordered matrix by adding *r* singular vectors corresponding to zero singular values, where *r* is the nullity of the singular stiffness matrix. Besides, *r* constraints are accompanied to result in a nonsingular matrix. Only the pure particular solution with nontrivial strain is then obtained but without the homogeneous solution of no deformation. To link with the Fredholm alternative theorem, the slack variables with zero values indicate the infinite solutions while those with nonzero values imply the case of no solutions. A simple space truss is used to demonstrate the validity of the proposed model. An alternative way of

reasonable support system to result in a nonsingular stiffness matrix is also addressed. In addition, the finite-element commercial code ABAQUS is also implemented to check the results.

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