

國立中山大學應用數學系

學術演講

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講題：An introduction of the GE/BC embedded collocation method

時間：2020/12/17（Thursday）15:30 ~ 16:30

地點：理學院四樓理 SC 4009-1 教室

茶會：15:00 於理 SC 4010 室（系辦公室）

Abstract

In recent decades, meshless/mesh-free methods have drawn more and more attentions. General speaking, there are two types of meshless methods, the strong form and the weak form. Strong form methods, which use the collocation approaches for the approximation of the derivatives, are more straightforward and easy learning/coding. However, they are usually unstable. It was found that when doing the collocation at boundary points, making the governing equations (GE) satisfied as well as the boundary conditions (BC) are satisfied can improve the numerical stability of strong form meshless methods.

In this talk, the GE/BC embedded meshless method will be introduced. The word “embed” indicates that the GE is compelled to be valid in the local approximation. At boundary nodes, the BE is also embedded in the local approximation. This method uses the local polynomial for the approximation of the unknown function. The weighted-least-squares (WLS) approach is employed for making up the approximation. A boundary value problem (BVP) governed by an ordinary differential equation (ODE) is used to demonstration the improvement of embedding the GE and BC. Its applications to 2D and 3D practical problems will also be demonstrated.

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