國立中山大學應用數學系
學術演講

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講　題：Solving nonlinear elliptic equations in arbitrary plane domains by using a new splitting and linearization technique

時　間：2020/09/24（Thursday）15:30 ~ 16:30

地　點：理學院四樓理 SC 4009-1 室

茶　會：15:00 於理 SC 4010 室（系辦公室）

Abstract

For solving nonlinear elliptic equations in arbitrary plane domains, the meshless methods of radial-polynomial and Pascal-polynomial are easy to programming, which are employed as the bases to expand the solution. After a simple collocation technique, we can derive nonlinear equations to determine the expansion coefficients. We use a splitting parameter to split the nonlinear term into two nonlinear parts, which are separately placed on both sides of the nonlinear elliptic equation. Then, a new linearization technique is used to treat the nonlinear part on the left-hand side. In each iteration, the linear system of equations is regularized by the multiple-scale technique. The proposed methods converge very fast to obtain very accurate numerical solutions, which confirm the validity of the present splitting and linearizing technique to solve nonlinear elliptic equations in arbitrary domains.

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