THE UNIVERSITY  OF HONG KONG

Department of Mathematics

Numerical Mathematics and Applied Analysis Group Seminar (NMAA)

Application of the Homopoty Analysis Method to the Falkner-Skan Differential Equation

Mr. XU Liang
The University of Hong Kong

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in Room 309, Run Run Shaw Building, HKU

Abstract

Based on the use of homotopy (a basic concept in topology), a general analytic method (namely the homotopy analysis method) was proposed by S. Liao to obtain series solutions of nonlinear differential equations. Different from all previous analytic methods, it provides us with a simple way to adjust and control the region of convergence of the solution series. In this talk, we will explain carefully how to apply the homotopy analysis method to the Riccati differential equations as well as the following Falkner-Skan differential equation:

$$f'''(\eta) + f(\eta) f''(\eta) + \beta[1 - f'^{2}(\eta)] = 0,$$

subject to the boundary conditions $f(0) = f'(0) = 0, f'(+\infty) = 1.$

All are welcome