The Hong Kong Polytechnic University
Department of Applied Mathematics

Colloquium

On

On the numerical solution of Volterra integral equations of the first kind

by

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Abstract

The first part of this talk will deal with a brief review of numerical methods for solving Volterra integral equations of the first kind. Since such problems are ill-conditioned, numerical schemes based on higher-order quadrature formulas or on collocation using continuous piecewise polynomials are in general unstable, and one has to look for alternative approximation methods, such as discontinuous Galerkin (DG) methods.

In the second part I shall describe recent and ongoing joint work with P.J. Davies (University of Strathclyde) and D.B. Duncan (Heriot-Watt University) on DG and related discontinuous collocation methods for first-kind Volterra integral equations. These numerical methods are now quite well understood, except when the given Volterra integral equations possess highly oscillatory or weakly singular kernels. For such equations the convergence analysis of DG and collocation methods remains essentially open – a great challenge for numerical analysts.

Date : **27 November, 2009 (Friday)**

Time : **3:00 – 4:00 p.m.**

Venue : **Departmental Conference Room HJ610**
The Hong Kong Polytechnic University

*** * * ALL ARE WELCOME * * ***