



**The Hong Kong Polytechnic University
Department of Applied Mathematics**

Colloquium

On

**On Positivity Preservation in the Finite Element
Method for the Heat Equation**

by

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Abstract

We consider piecewise linear finite element discretizations of the model initial-boundary value problem for the homogeneous heat equation, and discuss the preservation of positivity in the time evolution of the solution.

We first demonstrate that for the spatially semidiscrete standard Galerkin approximation this property does not hold in general, but that it is valid for the lumped mass variant if and only if the underlying triangulation is of Delaunay type.

We also present some results for the simplest time stepping methods, such as the theta-method, and the (0,2) Padé approximation in one space dimension.

Date : 17 January, 2013 (Thursday)

Time : 11:00 a.m. – 12:00 noon

Venue : HJ610, The Hong Kong Polytechnic University

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