Vidar Thomee (Chalmers University of Technology, Göteborg):

**On positivity preservation in the finite element method for the heat equation**

2012. november 19. 11:00

Location: SZE – VIP terem

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 is not valid in general, but holds for the lumped mass variant, if and only if the 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.