数学与系统科学研究院

计算数学所学术报告

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报告题目：

Multiwavelet Bases on $[0,1]$ with Simple Structure

邀请人：　许志强 研究员

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上午 10:00-11:00

报告地点：　科技综合楼三层

311 报告厅

Abstract:

Though wavelet methods for numerical computing have been extensively studied for many years, they are not that successful so far due to several obstacles, e.g., wavelet bases on the interval $[0,1]$ have complicated structure and often fail boundary conditions. Spline wavelet bases are often required for numerical computing. Except B-splines, another difficulty is that there are not many known spline refinable vector functions for building spline multiwavelet bases on $[0,1]$. In this talk, we shall first study spline refinable vector functions and spline multiwavelets. Next we shall discuss biorthogonal and derivative-orthogonal multiwavelets in Sobolev spaces. As an example, we present a biorthogonal multiwavelet and a derivative-orthogonal multiwavelet derived from refinable Hermite cubic splines. Then we shall present a general method for constructing Riesz multiwavelet bases on the interval $[0,1]$ derived from symmetric multiwavelets on the real line. Such multiwavelet bases have two main advantages: (1) they have the simplest structure with only one boundary wavelet at each endpoint. (2) they can easily satisfy the homogeneous Dirichlet (or von Neumann) boundary condition. An example constructed from Hermite cubic splines will be provided.

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