

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:

**Effective wavelet representations in
high dimensions**

邀请人: 许志强博士

报告时间: 2009年9月28日(周一)

下午 4:00—5:00

报告地点: 科技综合楼三层 311

计算数学所报告厅

Abstract:

I will first provide a brief overview of the wavelet representation and connect it with pyramidal representations such as the laplacian. I will then discuss a new wavelet-based methodology for representing data on regular grids. The specific highlights on the new representation are three. First, it is computed and inverted by fast algorithms with linear complexity and very small constants; moreover, the constants in the complexity bound decay, rather than grow, with the spatial dimension. Second, the representation is accompanied by solid mathematical theory that reveals its performance in terms of the maximal level of smoothness that is accurately encoded by the representation. Third, the localness of the representation, measured as the sum of the volumes of the supports of the underlying mother wavelets, is extreme. An illustration of this last property is done by comparing the

widely used tensor–product biorthogonal 9/7,
with a system of ours with similar
performance. Our representation has, in 10D,
localness score <29 . The localness score of the
9/7 is, in that same dimension, $>575,000,000,000$.

简介： Professor Amos Ron 是逼近论领域国际领袖数学家之一。逼近论核心杂志 *Journal of Approximation Theory* 主编。在样条函数、多元多项式插值、Frame 理论、小波等领域有着杰出的贡献。在这个报告里，他将介绍一个活跃的研究课题及目前所得到的结果。

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