数学与系统科学研究院

计算数学所学术报告

报告人：　安聪沛 副教授

（ 西南财经大学 ）

报告题目：

Regularized weighted least squares approximation by orthogonal polynomials

邀请人：　许志强 研究员

报告时间：**2019** 年 **6** 月 **10** 日（周一）

上午 **10:00**

报告地点：　数学院南楼二层

204 教室

Abstract:

We consider polynomial approximation over the interval [-1,1] by a class of regularized weighted discrete least squares methods with ℓ_2- regularization and ℓ_1-regularization terms, respectively. It is merited to choose classical orthogonal polynomials as basis sets of polynomial space with degree at most L. As node sets we use zeros of orthogonal polynomials such as Chebyshev points of the first kind, Legendre points. The number of nodes, say $N+1$, is chosen to ensure $L\leq2N+1$. With the aid of Gauss quadrature, we obtain approximation polynomials of degree L in closed form without solving linear algebra or optimization problem. As a matter of fact, these approximation polynomials can be expressed in the form of barycentric interpolation formula when the interpolation condition is satisfied. We then study the approximation quality of ℓ_2-regularization approximation polynomial, especially on the Lebesgue constant. Moreover, the sparsity of ℓ_1-regularization approximation polynomial, respectively. Finally, we give numerical examples to illustrate these theoretical results and show that well-chosen regularization parameter can provide good performance approximation, with or without contaminated data.

欢迎大家参加！